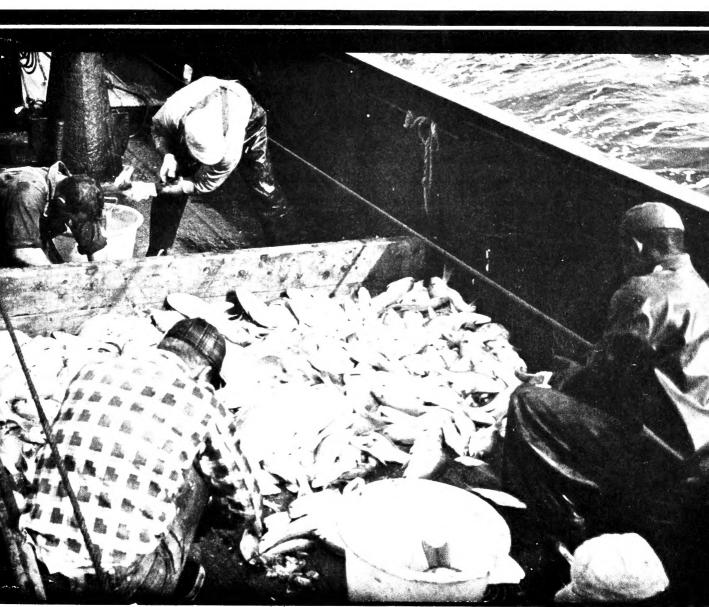


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United States Department of the Interior
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UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE ARNIE J. SUOMELA, COMMISSIONER BUREAU OF COMMERCIAL FISHERIES

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

> Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

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SHRIMP EXPLORATION IN CENTRAL ALASKAN WATERS BY M/V JOHN N. COBB, JULY- AUGUST 1958

By Melvin R. Greenwood*

SUMMARY

The growth of Alaskan shrimping, which began in 1916, was apparently handicapped by the high cost of hand picking of shrimp and by high transportation rates. The introduction in 1956 of peeling machines on the West Coast for processing the small cocktail-size shrimp and the subsequent successful use of those machines, has renewed interest in the possibilities of expanding the existing Alaskan fishery.

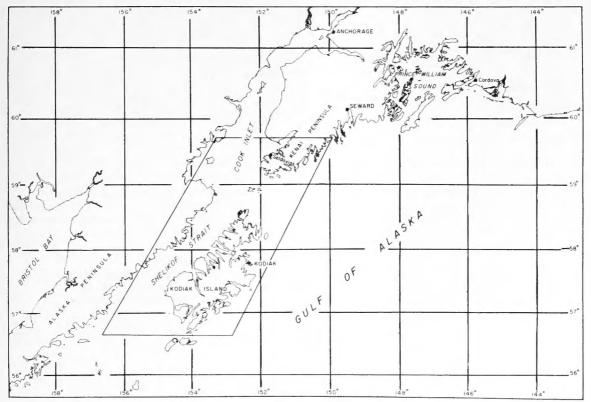


Fig. 1 - Central Alaska. Outline shows areas explored by the $\underline{John\ N}$. \underline{Cobb} , during shrimp explorations in July and August 1958.

Considerable information regarding the latent shrimp resources of Alaska has been obtained in recent years through explorations conducted by the U. S. Bureau of Commercial Fisheries. To assess the shrimp populations of Lower Cook Inlet and *Fishery Methods and Equipment Specialist, Branch of Exploratory Fishing and Gear Research, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

Kodiak Island, the Bureau's exploratory fishing vessel, <u>John N. Cobb</u> did exploratory fishing between July 22 and August 26, 1958. During the cruise a total of 109 drags was made using Gulf of Mexico-type shrimp trawls.

Excellent shrimp catches in Kachemak and Marmot Bays consisted of up to 1,770 and 1,400 pounds of heads-on shrimp per half-hour tow, respectively. Trawl-

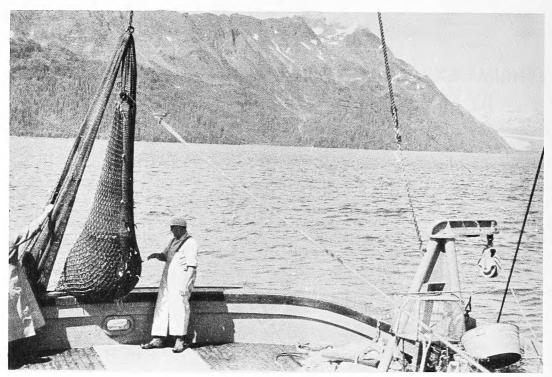


Fig. 2 - Cod end of shrimp trawl on John N. Cobb with catch of shrimp from Nuka Passage, Kenai Peninsula, Alaska.

ing in numerous other areas--Alitak, Kukak, Nuka, and Uganik Bays, Inner Nuka Passage, Port Dick, and Raspberry Strait--also produced good catches. In contrast to exploratory findings in other areas, Central Alaskan catches contained substantial quantities of sidestripe shrimp with averages for individual drags ranging from 23 to 69 whole shrimp per pound and coonstripe shrimp with drag averages ranging from 16 to 84 shrimp per pound. Pink shrimp averaging 56 to the pound in some drags, were also common.

Most good shrimp catches contained relatively few fish. Although considerable poor trawling bottom was indicated by echo-sounding, the grounds actually fished were almost entirely free of bottom obstructions. Snags were encountered only twice during the cruise.

BACKGROUND

Shrimp fishing in Alaska began in the southeastern region near Petersburg and Wrangell in 1916, and it has since become an important "off-season" fishery (Wigutoff 1953). Expansion of shrimping to other areas of Alaska has been attempted; however, those occasional ventures have been sporadic and on a small scale (Bower 1917-48; and Thompson 1950-56). Apparently the growth of the fishery has been handicapped by the high cost of hand-picking small pink shrimp and high transportation rates. The successful use of mechanical peeling machines, introduced to the West Coast in 1956, has served to renew interest in the expansion of the Alaskan shrimp fishery.

In recent years the Bureau of Commercial Fisheries has acquired considerable information concerning the latent shrimp resources in various waters of Alaska. From 1950 through 1957, nine shrimp explorations were conducted; 5 off Southeastern Alaska, 1 in Yakutat Bay, 2 in Prince William Sound, and 1 extending from near the Shumagin Islands to the Unalaska Island area. 1/ These explorations revealed numerous areas having commercial potential. The most successful cruise was made in 1957 when catches ranged up to 3,800 pounds in a half-hour drag in the Shumagin Island area. Although results of earlier explorations were not as outstanding, catches might have been larger if fishing had been conducted with a Gulftype trawl rather than with a small beam trawl.

In some Central Alaskan waters, commercial fishermen periodically have reported large catches of shrimp. Indications of a potential shrimp resource in Olga Bay, Kodiak Island, were noted during king-crab explorations conducted by the U.S. Fish and Wildlife Service in 1940 (U. S. Fish and Wildlife Service 1942). Pink shrimp were also taken in a midwater trawl between Cape Douglas and Shuyak Island in 1957 (Aron 1958). The Lower Cook Inlet and Kodiak Island areas, however, had not been systematically explored for shrimp prior to 1958.

Between July 22 and August 26, 1958, the shrimp resources in Central Alaskan waters were assessed by the Bureau's North Pacific Fisheries Exploration and Gear Research Station. Fishing was carried out with the exploratory fishing vessel John N. Cobb in waters of Lower Cook Inlet, along the Kenai Peninsula, and adjacent to Kodiak Island (fig. 1). Objectives of the cruise were to: (1) locate and determine species, size, and abundance of shrimp, (2) determine the bottom conditions on prospective shrimp grounds, and (3) collect oceanographic data which could be helpful in understanding shrimp distribution as related to the environment.

GEAR USED

All but two drags during the cruise were made with a $1\frac{1}{2}$ -inch mesh, $\frac{2}{2}$ standard 43-foot, 3/ Gulf of Mexico-type, flat shrimp trawl similar to that described by Schaefers and Johnson (1957). The net was attached directly to the back of the doors with two-foot extensions of the headrope and footrope.

The ground chain of the 43-foot net was equal in length to the footrope. Its ends were shackled at the junction points of the breastlines and footrope, and 14-link dropper chains were hung between the footrope and ground chain at intervals of 24 inches. During the last few drags of the cruise the net was fished with the dropper chains removed, leaving the ground chain attached only at its ends. The trawl was towed with a single cable attached to a 25-fathom bridle ahead of the doors.

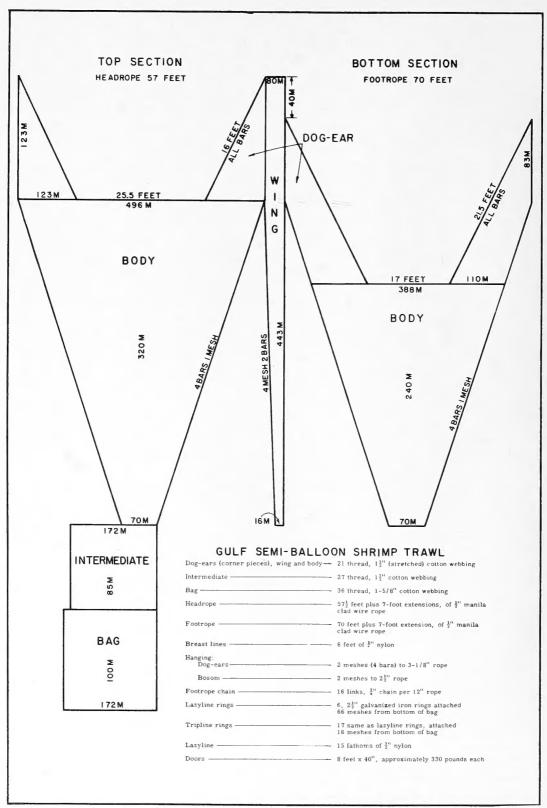
Two drags were made with a $1\frac{1}{2}$ -inch mesh, 70-foot, Gulf of Mexico-type, semiballoon shrimp trawl (fig. 3).4/ This net was towed in the conventional otter-trawling manner with warps from the vessel to each door. Seven-foot headrope and footrope extensions, plus 5-foot chains fastened to the trailing edge of the door, resulted in a total distance of 12 feet between the door and the net.

Both nets were fished using standard Gulf of Mexico-type doors (Bullis 1951). which are lighter than doors used by Pacific coast otter trawlers. Doors for the small net measured $2\frac{1}{2}$ by 5 feet and weighed 160 pounds each, while the doors for the large nets measured $3\frac{1}{2}$ by 8 feet and weighed 385 pounds each.

^{1/}For results of those surveys see: Schaefers 1951, 1953; Ellson and Livingstone 1952; Schaefers and Smith 1954; Schaefers et al 1955; Greenwood 1958; and Johnson 1959.

All mesh sizes referred to in this report are stretched measure including 1 knot.

All sizes given in this report represent the length of the footrope, excluding the extension straps.
 4/Note that the net in figure 3 is drawn in conformance with the net-illustrating method proposed by W. Dickson at the International Fishing Gear Congress, Hamburg, Germany, 1957; i. e., all lengths are true to scale (stretched measure), while all widths are reduced 50 percent.



 $\label{eq:Fig. 3-Seventy-foot Gulf of Mexico-type semiballoon shrimp trawl used during shrimp explorations in Central Alaska.$

A warp-length to water-depth ratio (scope) of approximately 3 to 1 was used, and the nets were towed at speeds between 2.5 and 3.0 knots. Drags were of 30-minute duration, except for five 15-minute drags off Port Dick, where the lack of available grounds precluded longer tows.

FISHING RESULTS

Three species of shrimp were taken in commercial quantities during the cruise. Small cocktail-size pink shrimp (Pandalus borealis) were taken throughout the area of operation. A larger species--sidestripe shrimp (Pandalopsis dispar) were also found to be widely distributed. Coon-stripe shrimp (Pandalus hypsinotus), representatives of another larger species, were caught mostly in the Kenai Peninsula area. Other species which were taken in small quantities included: dock shrimp (Pandalus danae), spot shrimp (Pandalus platyceros), humpy shrimp (Pandalus goniurus), Eulas suckleyi, Eulas macilentus, and several species of gray shrimp belonging to the family Crangonidae.



Fig. 4 - Catch of shrimp on sorting table aboard M/V John N. Cobb in Kachemak Bay, Alaska. Note: Sorting table holds 1,000 pounds of shrimp, level-full.

Excellent shrimp catches were made in Kachemak Bay and Marmot Bay hear the towns of Homer, Seldovia, and Kodiak. Catches as large as 1,770 pounds of shrimp were taken in Kachemak Bay, and catches up to 1,400 pounds were taken in Marmot Bay. The average catch, for drags made in those two bays, was 655 and 603 pounds, respectively.

Trawling in many smaller bays and inlets, within about 5 to 11 hours running time of Homer, Seldovia and Kodiak, also produced good catches. Drags in Alitak Kukk, Nuka, and Uganik Bays, inner Nuka Passage, Port Dick, Raspberry Strait, and off Cape Douglas yielded shrimp at rates ranging from 265 to 950 pounds per half hour.

In contrast to the results of Bureau explorations conducted off Washington and Oregon, many shrimp catches taken off Alaska contained substantial quantities of

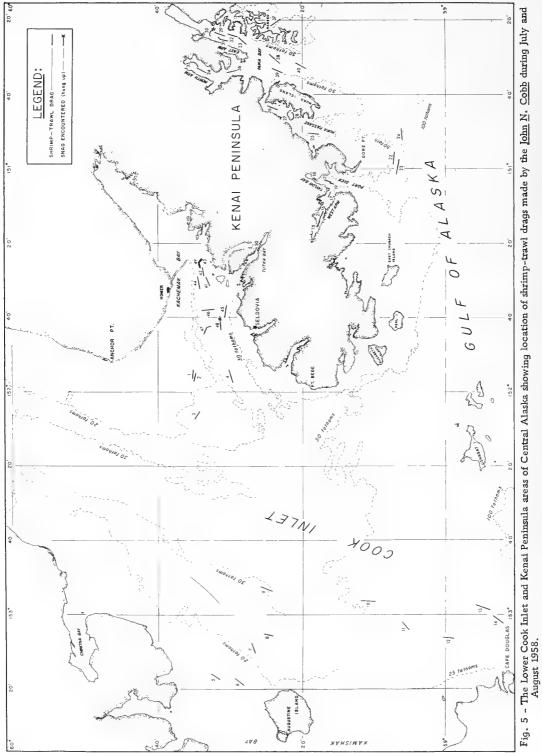




Fig. 6 - The Kodiak Island and Shelikof Strait areas of Central Alaska showing location of shrimp-trawl drags made by the John N. Cobb during August of 1958.

sidestripe and coonstripe shrimp. In several bays along the Kenai Peninsula those species were predominant in the catches.

Although the slopes of many of the bays were found to be relatively steep, clear trawling bottom prevailed in most areas fished. Snags were encountered only twice during the cruise, and in both instances net damage was slight. The bottom was composed of mud or a mixture of mud and sand in areas yielding good catches of shrimp.

The location of each of the 109 exploratory drags made during the investigation is diagramatically presented in figures 5 and 6.

FISHING RESULTS IN LOWER COOK INLET AND KENAI PENINSULA AREAS: The best catches in the Lower Cook Inlet and Kenai Peninsula areas were made in



Fig. 7 - Hoisting cod end full of shrimp over rail of John N. Cobb in Kachemak Bay, Alaska.

Kachemak Bay, off Cape Douglas, in Port Dick, in Nuka Passage, and off Ragged Island. Most drags made in Cook Inlet and in offshore waters south of Kenai Peninsula yielded little or no shrimp.

Kachemak Bay: The most productive catches in Kachemak Bay were taken from a deep area off Homer Spit and the northern slope of the gully which runs along the southern shoreline between Homer Spit and Seldovia Bay. Five drags made in depths ranging from 53 to 92 fathoms in and near the deep, which is located about 5 miles southwest of the end of Homer Spit, resulted in catches of 360 to 1,020 pounds of shrimp. From 36 to 79 percent of those catches consisted of 26-to 48-count 5/ sidestripes. On the north slope of the gully near Seldovia Bay, two drags made at depths between 39 and 50 fathoms caught 740 and 1,770 pounds of shrimp, mostly 200-count pinks. One drag made in Tutka Bay, in 41 to 52 fathoms, resulted in 810 pounds of mixed pink and coonstripe shrimp. The coonstripe shrimp, which made up about 39 percent of this catch, averaged 28 shrimp per pound heads on.

Cook Inlet: Catches in Lower Cook Inlet were poor. Twelve

drags made between Kachemak Bay and Kamishak Bay at depths between 15 and 86 fathoms caught about 70 pounds of shrimp. Most of the inlet south of Anchor Point is shallow (less than 40 fathoms), and a large part of the bottom is irregular and probably not suitable for trawling.

5/All shrimp counts given in this report indicate the average number of heads-on individuals per pound, and were obtained from random samples. Selected shrimp, i.e., those caught with larger mesh nets, or graded shrimp, would be expected to count out much larger than do the random samples. Catch rates are expressed as pounds of heads-on shrimp.

Cape Douglas: Two drags, made 7 to 11 miles off Cape Douglas in 88 to 91 fathoms, resulted in 540 and 600 pounds of mixed pink and sidestripe shrimp. Sidestripes accounted for 15 and 33 percent of those catches, respectively.

Port Dick: The limited area suitable for trawling, and the relatively steep side slopes in Port Dick made it necessary to shorten the trawling time of most drags to 15 minutes. The upper end of West Arm afforded the best trawling bottom despite a large kelp bed which was encountered about 3 miles from the end of the bay. Three drags made in this area at depths between 58 and 101 fathoms yielded 240 and 360 pounds of shrimp in the 15-minute drags and 870 pounds in the half-hour drag. Four drags were made on the steep side slopes of Port Dick. One of those drags, starting in 139 fathoms and ending in 36 fathoms, yielded 540 pounds in 30 minutes. The average catch rate for all drags made in Port Dick was 510 pounds of shrimp per half hour drag.

Catches in Port Dick were composed of mixed pink, sidestripe, and coonstripe shrimp. Although pink shrimp dominated the catches, a considerable quantity of sidestripe and coonstripe shrimp were taken. Pinks ranged in size from 75 to 120 count; sidestripes, from 37 to 69 count; and coonstripes, from 30 to 84 count.

OFFSHORE WATERS SOUTH OF KENAI PENINSULA: Only trace amounts of shrimp were taken in three drags made in offshore waters 6 to 8 miles south of Gore

Point. Extensive soundings, within about 10 miles of the peninsula, revealed no other likely offshore shrimp-trawling grounds between Nuka Bay and the eastern entrance to Cook Inlet.

Nuka Passage: Three drags made in the inner part of Nuka Passage, at depths ranging from 49 to 84 fathoms, produced from 390 to 780 pounds of shrimp each. The catches were composed of about half pink shrimp and half mixed sidestripes and coonstripes. The pinks averaged 71 to 96 shrimp to the pound, while the sidestripes ran 44 to 69 per pound. The coonstripes in those catches averaged 23 to 27 shrimp per pound.

Nuka Bay Area: Fishing results in Nuka Bay indicated the presence of a large shrimp population which was widely distributed throughout the bay. The best catches were made in East Arm at depths between 47 to 124 fath-



Fig. 8 - Ready to spill catch of shrimp onto sorting table aboard M/V $\underline{\rm John}\ \underline{N}.\ \underline{\rm Cobb}$ in Kodiak Island area.

oms. Five drags made in this area yielded from 240 to 330 pounds of shrimp each. Those catches consisted of 32 to 62 percent pinks, 33 to 62 percent sidestripes, and 1 to 9 percent coonstripes. The size of pink shrimp taken in that area ranged from 86 to 109 shrimp per pound, while sidestripes ranged from 41 to 58 to the pound. A snag was encountered in East Arm where the net was fished too close to the submarine moraine of McCarty Glacier.

In other portions of Nuka Bay, at depths between 69 and 158 fathoms, six drags resulted in 150 to 280 pounds of shrimp. Those catches consisted of 54 to 71 percent pinks ranging from 67 to 73 shrimp per pound, 25 to 45 percent sidestripes ranging from 27 to 40 shrimp per pound, and up to 12 percent coonstripes which ran 16 to 21 shrimp per pound (heads on).

A single drag made southwest of Ragged Island yielded a catch of relatively large shrimp. In a total catch of 450 pounds, 39 percent of the catch comprised 86-count pinks, 55 percent was composed of 23-count sidestripes, and 6 percent was 18-count coonstripes.

FISHING RESULTS IN THE KODIAK ISLAND AND SHELIKOF STRAIT AREA: Explorations during the last half of the Central Alaskan cruise were conducted principally in Marmot Bay and Shelikof Strait. Excellent catches of shrimp were made in Marmot Bay, but catches in Shelikof Strait were generally poor. Some of the small bays and inlets along Kodiak Island and Shelikof Strait yielded good catches.

Marmot Bay Area: Although the bottom in Marmot Bay was generally clear, irregular bottom, suitable for short drags only, was found in the gully on the north

Fig. 9 - A catch consisting predominantly of fish, taken from Shelikof Strait during exploratory fishing.

side of Spruce Island. Fifteen drags in Marmot Bay yielded an average of 603 pounds of shrimp each.

In Inner Marmot Bay six drags at depths from 58 to 109 fathoms resulted in 350 to approximately 1,400 pounds of shrimp per drag. 6/ Those catches were composed of 56 to 83 percent pinks ranging in size from 104 to 127 shrimp per pound. Sidestripe shrimp, which comprised the balance of those catches, ranged from 34 to 51 shrimp to the pound.

Three drags made off Izhut Bay in 93 to 111 fathoms caught 730, 850, and 1,300 pounds of shrimp each. Those catches were composed of 73, 69, and 92 percent pinks with average counts of 135 to 172 per pound. The balance of the catch was sidestripe shrimp averaging from 41 to 51 individuals to the pound.

In Outer Marmot Bay six drags were made at depths between 69 and 110 fathoms. Except for drag No. 103, which produced approximately 700 pounds of pink shrimp averaging 94 shrimp to the pound, catches ranged from 120 to 300 pounds per drag. Those catches were composed of 54 to 89 percent pinks which ran 59 to 77 shrimp per pound. The remaining portions of the catches were 24-to 42-count sidestripes.

Shelikof Strait: Pink and sidestripe shrimp were found distributed throughout Shelikof Strait, but in concentrations considerably less than found in adjacent bays. 6/The size of the largest catch had to be estimated and counts were unobtainable as the whole catch was lost when the cod end parted from the intermediate as the catch was being lifted over the stern rail.

The best catches were made on the bank between Shuyak Island and Cape Douglas in depths of 82 to 88 fathoms. Two drags in this area yielded 200 and 300 pounds of shrimp containing 72 and 90 percent pinks averaging 96 and 70 shrimp per pound, respectively. Sidestripe shrimp, which made up the balance of those catches, ran 45 and 53 shrimp to the pound. A drag off Raspberry Island in 106 to 107 fathoms resulted in 250 pounds of which 63 percent was 44-count sidestripes and 37 percent was 81-count (heads-on) pinks.

The remaining 33 drags made in Shelikof Strait at depths ranging between 68 and 154 fathoms yielded up to 180 pounds of shrimp per drag.

Miscellaneous Bays and Inshore Waters: Although fishing results were generally good in each of the five smaller bodies of water fished in the Kodiak area, insufficient time was available to determine the full extent of trawlable grounds or the distribution of shrimp. Priority was given to exploring offshore waters during the the final phase of the cruise; consequently only eight drags were made in those protected waters.

The single drag made in Kukak Bay in 57 to 63 fathoms caught 950 pounds of shrimp; about half pinks and half sidestripes. The pinks averaged 117 shrimp to the pound, while the sidestripes averaged 32 shrimp per pound.

		Number of drags (those catching 150 pounds or more shrimp	Pounds of head shrimp per half-hour d	raq	Miscellaneou (percentage of catch vei	of total 'ght)	Predominant species of miscellaneous fish
		per half hour)	Range	Avg.	Range	Avg.	
	Nuka Passage	3	390 - 775	612	3 - 15	ent)	Alaska pollock
соок	Kachemak Bay	8	150 - 1,770	708	2 - 22	8	halibut, herring, sculpin
INLET	Tutka Bay	1		810		9	flathead and yellowfin "sole"
AND	Port Dick 1/	7	180 - 870	513	7 - 27	14	Alaska pollock
KENAI	Nuka Bay	11	150 - 330	248	8 - 37	16	turbot2/
PENINSULA	off Cape Douglas	2	540 - 600	570	26 - 28	27	Alaska pollock, turbot
AREA	off Ragged Island	1		450		39	turbot
AREA	Cook Inlet	0					
	off Gore Point	0					
	Alitak Bay	2	500 - 900	700	2 - 4	4	sculpin
******	Kukak Bay	1		950		13	turbot
KODIAK	off Izhut Bay	3	730 - 1,300	960	13 - 24	16	turbot
ISLAND	inner Marmot Bay	2/ 5	350 - 1,100	610	4 - 32	19	turbot
AND	Uganik Bay	2	200 - 1,000	600	25 - 49	30	Alaska pollock, yellowfin "sole"
SHELIKOF	outer Marmot Bay	5	150 - 700	319	28 - 63	44	flathead "sole", turbot
AREA	Shelikof Strait	6	160 - 300	207	29 - 73	55	Pacific ocean perch, flathead "sole Alaska pollock, turbot
	Raspberry Strait	1		650		59	sablefish, flathead "sole", turbot
	Uyak Bay	2		200	70 - 83	78	flathead "sole", Alaska pollock,

1/Includes five 15-minute drags. Catch analysis adjusted to half-hour rate. 2/Does not include Drag No. 98 as catch breakdown was not obtained. 3/Arrow-toothed flounder.

One drag made in Uganik Bay (South Arm) in 35 to 41 fathoms caught 1,000 pounds of shrimp. That catch was 87 percent pink and dock shrimp and 13 percent coonstripes. Counts for those species were 117, 129, and 81 heads-on individuals to the pound, respectively. The other drag in Uganik Bay was made in 88 to 94 fathoms and caught 200 pounds of shrimp.

Two drags made in Uyak Bay each caught 200 pounds of shrimp of which more than half was sidestripes.

Two drags in Alitak Bay caught 500 and 900 pounds of shrimp consisting of approximately 80 percent pink and dock shrimp and 20 percent sidestripes and constripes. Pinks ranged from 108 to 133 shrimp per pound; dock shrimp averaged 115; sidestripes averaged 40; and coonstripes averaged 65 shrimp per pound.

The single drag made in Raspberry Strait caught 650 pounds of 115-count pink shrimp.

MISCELLANEOUS FISH CATCH: In catches containing 150 pounds of shrimp or more, the weight of incidentally-caught fish varied between 2 and 83 percent of the total catch (table 1). Areas producing the least amount of miscellaneous fish included: Alitak Bay, Kachemak Bay, Nuka Passage, and Tutka Bay. Areas producing a considerable amount of miscellaneous fish included: Outer Marmot Bay, Raspberry Strait, Shelikof Strait, and Uyak Bay. The latter areas generally yielded mediocre or poor catches of shrimp.

The most commonly caught miscellaneous fish were Alaska pollock (Theragra chalcogramma) and turbot (arrow-toothed flounder, Atheresthes stomias). Flathead "sole" (Hippoglossoides elassodon) were caught in considerable numbers in several areas. Other food fish noted in the catches included: halibut (Hipploglossus stenolepsis), herring (Clupea pallasii), Pacific ocean perch (Sebastodes alutus), sablefish, Anoplopoma fimbria, and the yellowfin "sole" (Limanda aspera).

King crab (Paralithodes camtschatica) were caught in small numbers. Only 35 of the 109 drags caught king crab and only 7 of those caught more than 5 crabs.

MISCELLANEOUS OBSERVATIONS

Weather and oceanographic observations were recorded at each fish position. 7/Air temperatures averaged about 51° F., surface water temperatures averaged about 49° F., and bottom water temperatures averaged about 42.5° F. during the explorations in Central Alaska (table 2).

Table 2 - Summary of Temperature Observations Made During									
Shrimp Explo	Shrimp Explorations in Central Alaska								
	Cook Inlet	- Kenai	Kodiak Island	l - Shelikof					
	Peninsula	Area	Strait Area						
	Range	Avg.	Range	Avg.					
	°F.								
Air temperatures	49 -56	51.7	48 -56	51.1					
Surface temperatures	46 -53.5	49.6	45 -51	49.0					
Bottom temperatures	41 -47	43.4	38 -44.5	41.9					
Difference between surface									
and bottom temperatures	1.0-12.5	6.2	2.0-11.5	7.2					

Although rain occurred on approximately half the days spent in Central Alaska, and fog was occasionally encountered, at no time were fishing operations curtailed because of weather conditions. When wind and sea conditions made fishing in open waters undesirable explorations were carried out in sheltered areas.

APPENDIX

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available as an appendix to the Supplemental oceanographic information is available at the Seattle office of the Branch of Exploratory Fishing and Gear Research.

reprint of this article. Write for Separate 553, which contains Table 3 - Fishing Log--Shrimp Trawl Drags Made in Lower Cook Inlet and Kodiak Island Area--July 22 to August 26, 1958 -- U. S. Fish and Wildlife Service Exploratory Fishing Vessel John N. Cobb.

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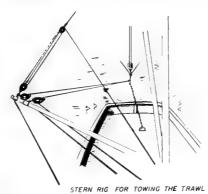
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Note: The shrimp explorations in Central Alaskan Waters were planned and carried out in cooperation with the Alaska Region, Bureau of Commercial Fisheries, and the Alaska Department of Fisheries. Members of the fishing industry were also consulted for views and ideas concerning the project. Representatives from all three groups accompanied the John N. Cobb at various times during fishing activities.



CURRENT STATUS OF THE INTER-AMERICAN DEVELOPMENT BANK

By Raymond E. Steele*

When the proposed Inter-American Development Bank is approved by the members of the Organization of American States through their regular legislative processes, it will be simpler and easier for United States businessmen to invest in Latin American industries. Since many United States fisheries interests have invested or are contemplating investing or working with Latin American countries in developing the fisheries of those countries, it would be to their advantage to study the purpose, responsibilities and functions of the Inter-American Development Bank, and how it can aid them in financing Latin American fisheries activities. . . . Editor.

The Inter-American Economic and Social Council on April 8 this year met in Washington and toasted the results of its fruitful work. The Specialized Committee of the Council termed it "Final Act." It set in motion the proposed "Inter-American Development Bank."

In the remarks of the Chairman of the Council at the April 8 meeting is this expression: "In thus completing its appointed task, this Committee has set forth the instrument of organization of what will doubtless become the most important inter-American institution dedicated to the promotion of economic development in our countries."

The Chairman meant "our countries" as being Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, United States, Uruguay, and Venezuela. The "instrument" is the charter of the Bank itself. Membership shall be comprised of the above countries. "The purpose of the Bank shall be to contribute to the acceleration of the process of economic development of the member countries, individually and collectively." (Article I).

The functions of the Bank as set forth in Section 2, Article I, are as follows:

"Section 2. Functions

- (a) To implement its purpose, the Bank shall have the following functions:
 - (i) to promote the investment of public and private capital for development purposes;
 - (ii) to utilize its own capital, funds raised by it in financial markets, and other available resources, for financing the development of the member countries, giving priority to those loans and guarantees that will contribute most effectively to their economic growth;
 - (iii) to encourage private investment in projects, enterprises, and activities contributing to the economic development and to supplement private investment when private capital is not available on reasonable terms and conditions;
 - (iv) to cooperate with the member countries to orient their development policies toward a better utilization of their resources, in a manner consistent with the objectives of making their economies more complementary and of fostering the orderly growth of their foreign trade; and
 - (v) to provide technical assistance for the preparation, financing, and implementation of development plans and projects, including the study of priorities and the formulation of specific project proposals.

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(b) In carrying out its functions, the Bank shall cooperate as far as possible with national and international institutions and with private sources supplying investment capital."

The authorized capital, referred to as the Fund is one billion dollars. Of this sum \$850,000,000 shall be divided into 85,000 shares having a par value of \$10,000 each, which is divided up as follows according to total subscriptions: Argentina - 10,134; Bolivia - 828; Brazil - 10,314; Chile - 3,832; Colombia - 2,830; Costa Rica - 414; Cuba - 3,684; Dominican Republic - 552; Ecuador - 552; El Salvador - 414; Guatemala - 552; Haiti - 414; Honduras - 414; Mexico - 6,630; Nicaragua - 414; Panama - 414; Paraguay - 414; Peru - 1,382; United States - 35,000; Uruguay - 1,106; Venezuela - 5,526.

Further legislative action on the part of the above countries is necessary before the Bank can get in business. Article XV states: "This Agreement (Charter) shall be deposited with the General Secretariat of the Organization of American States, where it shall remain open until December 31, 1959, for signature by the representatives of the Countries listed in Annex A (the 21 countries). Each signatory country shall deposit with the General Secretariat of the Organization of American States an instrument setting forth that it has accepted or ratified this Agreement in accordance with its own laws and has taken the steps necessary to enable it to fulfill all of its obligations under this Agreement."

This means that the legislatures of the respective countries have until the last of this year to appropriate the necessary funds for the Bank and formally adopt the charter. Due to the popularity of the Bank proposal in the Latin American countries there is little likelihood that any of them will refuse to act before the December 31 deadline. In the case of the United States, the proposal is reputed to be quite popular with the Congress and the Administration as well. It is the type of foreign aid program that seems to have great appeal in this country. Though the United States is to supply most of the funds for the Bank, it places a responsibility on each member country that is not inherent in our present grant-in-aid program.

There is, of course, great speculation as to when the Bank actually will be in business. The best guess is not before the end of the year. Besides the legislative action which must be taken by the member countries, the Bank will have to be set up under the "Organization and Management" provisions contained in Article VIII before it can function. Section one of this article states: "The Bank shall have a Board of Governors, a Board of Executive Directors; a President, an Executive Vice President, a Vice President in charge of the Fund, and such other officers and staff as may be considered necessary.

One of the provisions of the charter that will have great appeal to American investors is contained in Article XI, Section 4, "Immunity of Assets. Property and assets of the Bank, wheresoever located and by whomsoever held, shall be considered public international property and shall be immune from search, requisition, confiscation, expropriation, or any other form of taking or foreclosure by executive or legislative action."

The location of the Bank will be Washington, D. C. Arrangements are going on behind the scenes to house it at some desirable spot within the city. It will be sometime yet before the public is advised of the modus operandi the Bank will employ before receiving applications for loans. Meanwhile the stage is being set for various projects to get under way once the Bank is in business. An economic conference gets under way in Buenos Aires on April 27 which is designed to further study the development needs of Latin American countries. The chairman of the Inter-American Economic and Social Council had this to say: "We are certain that the Inter-American Development Bank will fulfill a truly important function in a moment of special significance to the economic evolution of the Hemisphere and we are also confident that the scope and effect of this action will surpass our most optimistic expectations."



PROXIMATE COMPOSITION OF GULF OF MEXICO INDUSTRIAL FISH

Part 3 - Fall Studies (1958)

By Mary H. Thompson*

ABSTRACT

The protein, oil, ash, and moisture content of limited samples of 17 species of industrial fish commonly taken during the fall in the Gulf of Mexico area are reported. Included also are length and weight data for those same species. The method of sampling is evaluated.

INTRODUCTION

Studies started in the winter of 1958 on the proximate composition of Gulf of Mexico industrial fish have been continued to include the fall months. The project



Fig. 1 - Shrimp is a valuable byproduct of industrial fishing.

was undertaken to provide more complete information for use by industrial fisheries on the protein, oil, ash, and moisture content of 17 representative species of industrial fish found in the area. Length and weight data have also been obtained.

Observations made during the fall months (September, October, and November) point to the necessity for tabulating the data seasonally, as moisture and oil content varies markedly in some species with meteorological conditions. The data should be gathered over a long period of time in order to show the true trends and variations. Since, however, there is an immediate need by industry for this information, an effort has been made to disseminate it as recorded.

SAMPLES

All samples for the fall series have been collected by laboratory personnel from boats landing in the Pascagoula area. These samples had been welliced for 2 to 3 days previous to collection and were in good to excellent condition upon arrival at the laboratory. They were immediately frozen in plastic bags and stored at -20° F. until analyzed.

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PHYSICAL MEASUREMENTS

The frozen fish were thawed, rinsed, and drained before physical measurements were made. The length measurements were of two types. Those species having a

well-defined fork tail were measured from the extreme tip of the mouth to the apex of the angle formed by the two sides of the tail. These are referred to in table 3 as "forktail" measurements. Those species having a more or less blunt tail were measured from the extreme end of the mouth to the farthest extension of the tail. These are referred to in table 3 as "overall" measurements. All length measurements are recorded in centimeters.

Weight measurements have been recorded in grams and were obtained by means of a double-beam balance. These figures are also given in table 3.

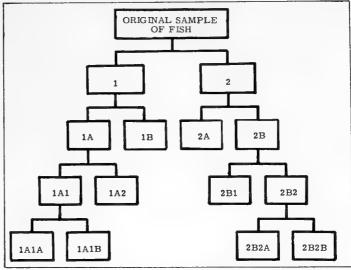


Fig. 2 - Procedure used in method B for obtaining analytical samples. Subsamples 1B, 2A, 1A2, and 2B1 are discarded. Subsamples 1A1A, 1A1B, 2B2A, and 2B2B are taken for analysis.

With the smaller fish (scad and anchovies), a random sample of 20 fish was selected for length and weight measurements as being representative of the whole lot.

Table 1 - Comparison of Sampling Methods A and BSllver Perch											
c 1:	6 1	Number of	Le	ngth	We	Weight		Composition of Sample			
Sampling Method	Sample Designation	Fish in Each Sample	Kange	Average	Range	Average	Protein	Oil	Ash	Moisture	
			Cm.	Cm.	Grams	Grams	Percent	Percent	Percent	Fercent	
Method A	1	4	16.3-17.5	16.8	43.5-61.3	51.4	15.9	1.5	3.15	79.1	
	2	4	15.5-18.4	16.9	49.9~62.6	54.4	16.9	2.4	5.07	75.6	
	3	4	15.9-17.8	17.0	40.0-61.4	51.2	16.4	2.5	4.74	76.2	
	4	4	14.8-17.1	16.7	32.3-50.1	50.4	16.5	2.4	4.97	76.6	
Avera	age or range	16	14.8-18.4	16.9	32.3-62.6	51.9	16.4	2.2	4.48	76.9	
Method B	la la	-	-	-	-	-	16.9	2.8	5.56	75.4	
	lA 1B	-	-	-	-	-	16.6	2.7	5.68	74.9	
	2B 2A	-	-	-	-	-	16.5	2.8	6.38	75.5	
	2B 2B	-		-	_		16.3	2.7	5.98	75.2	
Avers	age or range	15	13.1-17.5	15.8	24.6-55.8	40.0	16.6	2.8	5.72	75.3	

PROXIMATE COMPOSITION

The methods of proximate analysis used were described in detail in Part 1 of this series (Thompson 1959).

A study was made during the fall season in an effort to determine the best methods of sampling and grinding the fish. The procedure in use affords a range of values for each species, as the protein, oil, ash, and moisture content tends to vary within the species in any given season. It was necessary to determine whether this

was a true range or merely represented variations in sampling techniques. Two series of tests were made: one on silver perch and one on white trout. In each series, two methods of preparation were used: Method A and Method B.

Table 2 - Comparison of Sampling Methods A and BWhite Trout										
Sampling	Sample	Number of Fish in	Le	ength	Weight		Composition of Sample			
Method	Designation	Each Sample	Range	Average	Range	Average	Protein	Oil	Ash	Moisture
			Cm.	<u>Cm</u> .	Grams	Grams	Percent	Percent	Percent	Percent
Method A	1	2	21.3-24.0	22.7	105.8-133.3	119.6	17.4	7.4	2.41	72.9
	2	2	22.2-23.9	23.1	132.2-141.1	136.7	17.6	7.3	2.56	72.3
	3	2	21.6-24.2	22.9	115.1-136.6	125.8	17.6	4.6	2.86	74.9
	4	2	19.9-21.4	20.7	90.6-104.7	97.7	.18.2	5.3	3,89	72. 2
Average	or range	8	19.9-24.2	22.4	90.6-141.1	120.0	17.7	6.2	2.93	73.1
Method B	lA lA	-	-	-	-	-	17.6	6.1	3.91	73.1
	lA 1B	-	-	-	-	-	17.5	6.0	3.12	72.7
	2B 2A	-	-	-	-	-	17.6	5.9	3,30	73.0
	2B 2B	-	-		-	-	17.9	6.1	3.91	72.9
Average	or range	10	20.3-23.7	21.9	93.2-124.7	110.0	17.7	6.0	3.64	72.9

In Method A, the following procedure was employed:

- 1. Select at random a large lot of fish from an incoming fishing vessel.
- 2. From the lot, take sufficient silver perch or white trout to make a sample with an aggregate weight of at least 150 to 200 grams.

Table 3 - Location of Catch and Physical Measurements of Industrial Fish Commonly Obtained in the Fall								
Name	Date		Total Number	Type of	Len	gth	Wei	ght
Common Scientific	1958	Location	of Fish Analyzed	Measure- ment	Range	Average	Range	Average
Anchovies Anchon hepsetus	Oct.	Horn Is.	40	Forktail	10.4-12.7	11.5	Grans 10.6-20.4	Grows 13.7
Bumper Chloroscombrus chry	surus Sept.	Gulf Shores	8	Forktail	16.6-29.9	19.2	65.6-97.2	80.3
Butterfish Poronotus triacanth	us Nov.	Gulf Shores	8	Forktail	8.1-16.0	13.0	16.8-135.6	76.4
Croaker Micropogon undulatu	s Sept.	Gulf Shores	8	Over-all	19.3-21.4	20.7	73.6-110.2	94.7
Croaker, banded Larimus fasciatus	Nov.	East Gulf	8	Over-all	18.6-20.5	19.5	83.9-124.5	103.1
Grunt Haemulon sp.	Sept.	Gulf Shores	8	Forktail	13.0-19.0	16.0	31.3-121.7	67.1
Hardheads Galeichthys felis	Nov.	East Gulf	11	Forktail	14.3-21.8	17.4	40.2-146.7	69.4
Harvestfish 1 Peprilis alepidotus	Sept.	Gulf Shores	7	Forktail	14.2-16.7	15.3	57.7-84.2	68,8
Menhaden Brevoortia patronus	Oct.	Pascagoula	8	Forktail	13.0-18.0	16.3	42.4-122.6	94.8
Razorbellies Harengula pensacola	e Sept.	River Gulf Shores	20	Forktail .	11.8-14.4	13.0	27.8-51.0	38.6
Round herring . Etrumeus teres	Nov.	East Gulf	11	Forktail	15.1-21.0	18.4	42.2-106.9	75.3
Scad Trachurus lathami	Oct.	Horn Is.	24	Forktail	10.9-14.4	11.8	15.1-30.0	19.6
Silver eels Trichiurus lepturus (Cutlassfish)	Sept.	Gulf Shores	4	Over-all	65.0-72.1	67.4	147.1-211.5	179.5
Silver perch Bairdella chrysura	Oct.	Horn Is.	16	Over-all	14.8-18.4	16.9	32.3-62.6	51.9
Silver perch Method B Bairdella chrysura	Oct.	Horn Is.	15	Over-all	13.1-17.5	15.8	24.6-55.8	40.0
Spots Leiostomus xanthuru	s Sept.	Gulf Shores	12	Forktail	14.6-16.2	15.4	44.6-62.8	55.1
Threadfin2/ Polydactylus octone	mus Nov.	Sand Is.	16	Forktall	12.9-16.5	14.6	29.7-73.1	47.7
White trout, Method A Cynoscion sp.	Oct.	Horn Is.	8	Over-all	19.9-24.2	22.4	90.6-141.1	120.0
White trout, Method B Cynoscion sp.	Oct.	Horn Is.	10	Over-all	20.3-23.7	21.9	93.2-124.7	110.0
1/Figures are from 3 samples, instead of the usual 4 2/Figures are from 5 samples, instead of the usual 4 Note: Data on the proximate analysis of these fish a		4.		1				

- 3. Pass the sample through a food grinder (such as a General Food Grinder, Model H) three times.
 - 4. Take a portion of the ground material for an analytical sample.
 - 5. Repeat steps 2, 3, and 4, so as to form three additional analytical samples.

Thus, in Method A, four analytical samples result from four separate samples of fish.

In Method B, the entire lot is ground, divided in half, each portion reground, and half of the latter portions discarded. Each of the resultant samples is in turn reground, half of each discarded, and the remaining halves divided into two samples for analysis, as indicated in figure 2. Thus, in Method B, four analytical samples also result.

	Total Number	Protein		Oil		Ash		Moisture	
Common Name	of Fish Analyzed	Range	Average	Range	Average	Range	Average	Range	Averag
Anchovies	40	Percent 16.1-16.4	Percent 16.2	Percent 2.7-3.8	Percent 3.1	Percent 3.53-3.91	Percent 3.69	Percent 76.6-78.2	Percen 77.2
Bumper	8	18.1-19.2	18.6	4.7-5.4	5.1	3.11-5.13	3.91	70.2-73.4	72.2
Butterfish	8	16.1-16.9	16.6	1.5-3.1	2.6	1.92-2.85	2.37	76.9-80.6	78.5
Croaker	8	16.0-17.1	16.5	2.9-1.2	3.6	2.73-5.29	3,96	74.3-76.9	76.0
Croaker, banded	8	17.5-18.1	17.8	1.5-2.8	2.3	3.08-4.54	4.03	74.2-76.9	75.6
Grunt	8	16.0-17.1	16.6	7.1-11.8	9.9	2.99-4.48	3.71	68.1-72.5	70.2
Hardheads	11	15.4-16.0	15.7	7.9-9.7	8.8	4.23-6.31	5.34	69.1-70.8	69.8
Harvestfish2/	7	18.0-18.5	18.3	2.9-4.7	3.6	2.02-2.94	2.60	74.1-75.9	75.1
Menhaden	8	14.7-14.9	14.8	15.1-16.8	16.0	2.79-3.90	3.38	63.9-66.7	65.4
Razorbellieb	20	18.1-18.8	18.5	6.2-7.3	6.7	4.80-6.92	5.82	68.5-70.2	69.0
Round herring	11	18.3-19.0	18.7	1.1-4.7	3.0	3.47-3.82	3.72	73.7-77.1	75.3
Scad	24	16.9-17.5	17.3	2.0-2.5	2.2	3.03-4.28	3.55	76.5-77.6	76.9
Ellver eels, (Cutiassush)	4	17.5-18.0	17.8	1.9-3.3	2.7	3.09-4.04	3.51	75.5-77.8	76.4
Silver perch, Method A .	16	15.9-16.9	16.4	1.5-2.5	2.2	3.15-5.07	4.48	75.6-79.1	76.9
silver perch, Method B .	15	16.3-16.9	16.6	2.7-2.8	2.8	5.56-6.38	5.72	74.9-75.5	75.3
pots	12	16.7-17.1	16.9	2.4-4.1	3.5	3.34-4.31	4.00	75.7-77.3	76.7
Threadfin3/	16	17.3-18.3	17.8	5.1-8.5	6.8	3.44-4.12	3,73	69.9-72.9	71.7
White trout, Method A	8	17.4-18.2	17.7	4.6-7.4	6.2	2.41-3.89	2.93	72.2-74.9	73.1
White trout, Method B /The sampling was done by method A, a	10	17.5-17.9	17.7	5.9-6.1	6.0	3.30-3.91	3.64	72.7-73.1	72.9

3/Figures are from 5 samples, instead of the usual 4.
Note: Data on the physical measurements of these fish are found in Table 3.

Method A produces four different samples and therefore gives a range of values. Method B produces four samples, all of which should give the same values for a check of the grinding and sampling techniques and, in addition, produces two pairs of samples that should give the same values for a check of the analytical procedure.

Since both original samples for Methods A and B came from the same lot of fish, the mean values for both methods should agree. It was found that the mean of Method A in all cases fell within 3 standard deviations from the mean of Method B. Inasmuch as there is the possibility of variation in size and maturity of the fish at any one time, as well as other factors which seem to influence the proximate composition, it was felt that in many instances a range as well as a mean would be desirable. Thus the method giving the range of values (Method A) was chosen in preference to that giving one value for each lot. Tables 1 and 2 show the results of the comparison between these two methods using both silver perch and white trout.

Table 5 - Seasonal Chan ContentsSu	ges in Oil and mmer to Fall	Moisture
Common Name	Change in Oil Content Summer to Fall	Change in Moisture Content Summer to Fall
Anchorica		ent)
Anchovies	+0.5	-0.1
Bumper	-0.9	+0.9
Butterfish	-3.6	+2.5
Croaker	0.0	0.0
Hardheads	+2.1	-1.2
Harvestfish	-3.9	+2.1
Menhaden	-1.8	+2.1
Razorbellies	+1.7	-2.8
Silver eels (Cutlassfish).	+0.1	-1.5
Spots	-9.4	+8.6
Threadfin	+5.0	-4.9
White trout	+1.2	-1.2

Note: These estimations are based on only a few samples. Although the estimates represent the best presently available knowledge, further studies may change them.

Results of the present analysis are given in tables 3 and 4. In these tables, the total number of fish used may be divided by four to provide the approximate size of each subsample.

Table 5 indicates the seasonal changes in oil and moisture content of several species. Changes in protein and ash content are small; generally, the ranges overlap from one season to the next. These changes therefore are not presented.

For evaluation of trends, it is advisable to have a large number of samples over a period of years (Stansby 1954). According-

ly, the data accumulated are being presented without discussion in an effort to bring this information before the industry as soon as possible. Parts 1 and 2 of this series (Thompson 1959) together with the present part 3, provide proximate analysis information for some species on a four-season basis, yet the entire picture of fluctuations is not definitive. It will be necessary to obtain more samples to attain any degree of completeness.

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TECHNICAL NOTE NO. 54 - DICARBONYL COMPOUNDS AS COMPONENTS OF FISH ODOR

ABSTRACT

The presence of dicarbonyl and A-hydroxy carbonyl compounds of four carbon atoms or less, are indicated in 2,4-dinitrophenylhydrazine derivatives of mixed carbonyl compounds prepared from fresh and from frozen haddock. These compounds may be important odor and flavor components and possibly could be used as the basis for objective quality tests for fishery products.

INTRODUCTION

It has long been known that dicarbonyl compounds are important contributors to the flavor and odor of foodstuffs. Previous investigators have reported that diace-

tyl is partially responsible for the flavor and odor of butter and bread (Van Niel, Kluyver, and Dirx 1929; Hooft, Visser, and DeLeeuw 1935). Keeney (1957) reported the isolation of unknown d, B-dicarbonyl compounds from heated milk; and Underwood, Lerito, and Willets (1956) reported the isolation of a number of A-dicarbonyl compounds from maple syrup. Lundberg (1957) and Privett, Chipault, Schlenk, and Lundberg (1958) reported that the odor and flavor components of oxidized fish oils consist largely of unsaturated carbonyl and dicarbonyl



Fig. 1 - The preparation of derivatives from frozen haddock fillets.

compounds. Sinnhuber and Yu (1958) have suggested that malonaldehyde is the carbonyl compound active in the thiobarbituric acid (TBA) test for oxidative rancidity in fishery products. They refer to the work of Patton and Kurtz (1951) who concluded that malonaldehyde was the compound responsible for the red color developed with TBA reagent in oxidized milk fat.

The preparation of derivatives of dicarbonyl compounds from the neutral volatile distillate of haddock fillets are reported in this note.

PROCEDURE

The samples used in these experiments were skinless haddock fillets obtained either from fish that had been out of the water less than 24 hours or from fish that had been frozen and stored for 3 months at 14° F.(-10° C.) and then thawed in air at room temperature for 8 hours. The neutral volatile distillate, which exhibited a characteristic fish odor, was obtained by distilling a 1,500-gram sample of finely chopped fillet at room temperature under a vacuum of less than 1 micron (mercury) pressure. The volatile distillate was collected by condensation in a receiver immersed in liquid nitrogen.

The 2,4-dinitrophenylhydrazine derivatives of the carbonyl compounds present in the distillate were prepared by the method of Neuberg, Grauer, and Pisha (1952).

Fifty milliliters of a 60-percent perchloric acid solution containing 1.2 grams of 2,4-dinitrophenylhydrazine were added to 50 milliliters of the neutral volatile distillate. This reaction mixture was allowed to stand at room temperature for 24 hours. The resulting precipitate was centrifuged, washed with 30-percent perchloric acid and distilled water, and then oven dried at 122° F. (fig. 1).

RESULTS

The 2,4-dinitrophenylhydrazine derivatives were obtained from samples of both fresh and frozen haddock fillets. Although exact quantitative data were not obtained, the yield of 2,4-dinitrophenylhydrazine derivatives from the frozen samples was considerably greater than the yield from the fresh samples. A melting point determination gave little information except to indicate that the precipitate was not a pure compound. The melting point was indefinite, and decomposition of the derivative occurred. The derivatives were insoluble in ethanol and methanol, partially soluble in benzene and dioxane, but soluble in sodium ethylate. In sodium ethylate the derivatives formed a deep violet color, which is characteristic of dicarbonyl and d-hydroxy compounds (Neuberg and Strauss 1945). Infrared spectra indicated that the compounds were probably aliphatic in nature and that the greater percentage of the compounds contained four or less carbon atoms.

Dicarbonyl or A-hydroxy carbonyl compounds may prove to be important components of the odors of other fishery products such as fish oil and fish meal. It is also suggested that the production of the violet color by the 2,4-dinitrophenylhydrazine derivatives in sodium ethylate may serve as the basis for an objective quality test for fishery products.

SUMMARY

A neutral volatile distillate from fresh and frozen stored skinless haddock fillets was condensed at liquid nitrogen temperature by distillation at room temperature. A 2.4-dinitrophenylhydrazine solution was added to the distillate, and a precipitate was allowed to form for 24 hours at room temperature. The precipitate was then centrifuged, washed with 30-percent perchloric acid and distilled water, and then dried. No quantitative data were obtained on the amount of derivative formed; however, the frozen fish yielded a greater amount of derivative than did the fresh fish. The melting range of the derivative was large (indicating a mixture, not a pure compound) and decomposition occurred.

Color reaction in sodium ethylate, solubility data, and infrared spectra indicated that the derivatives had been formed from dicarbonyl and A-hydroxy carbon compounds of four or less carbon atoms. The carbonyl compounds may prove to be important components of the flavors and odors in fishery products, and a test for these compounds may serve as objective quality indexes in fishery products.

> --By George F. Mangan, Jr., Formerly Chemist, Fishery Technological Laboratory, U. S. Bureau of Commercial Fisheries, East Boston, Mass.

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SALMON SALAD

The new season's stock of canned salmon becomes available to the consumer towards the latter part of August. There are five separate and distinct species of salmon that comprise the bulk of the salmon canned in the United States. They



are the king, sockeye, silver, pink, and chum. These are all found in the waters of the Pacific extending from Alaska to California.

Almost everyone enjoys the characteristic rich flavor of salmon. The meat is fine in texture, yet firm and moist. The protein content is substantial in quantity and excellent in quality. Salmon contains the important mineral elements calcium, phosphorous, and iodine; and has generous quantities of vitamins A and D, thiamine, and riboflavin.

Each of these species of salmon is equally nutritious,

the difference being in the color and oil content of the meat and these differences account largely for the range in price. Thus the budgetwise homemaker is enabled to buy according to her specific needs.

The home economists of the U.S. Fish and Wildlife Service suggest "Salmon Salad."

SALMON SALAD

1, CAN (16 OUNCES) SALMON
2 CUP MAYONNAISE OR SALAD DRESSING CUP CHOPPED CELERY

2 TABLESPOONS CHOPPED SWEET PICKLE

2 TABLESPOONS CHOPPED ONION 2 HARD-COOKED EGGS, CHOPPED

1 HARD-COOKED EGG, SLICED

Drain salmon. Break into large piece. Combine all ingredients except lettuce and egg. Serve on lettuce; garnish with egg slices. Serves 6.



Alaska

FISH AND GAME BOARD SETS POLICY: The newly-created Alaska Board of Fish and Game has endorsed the Governor's policy decisions relating to the fisheries resources of Alaska, made prior to the creation of that Board, the Board Chairman announced May 7, 1959.

"The Board is pleased with the stand taken by the Governor on fish and game policy, made by him during the interim period prior to the convening of this Board. We are in complete harmony with the previous action," the Chairman said.

The Chairman and the Board also indicated approval of the selection of Clarence L. Anderson to head the new department. He was selected from a list of seven candidates submitted to Governor Egan by the Board.

"We believe that the first state legislature in the enactment of legislation covering the Department of Fish and Game (Chapter 94, SLA 1959) has created a workable and commendable act. We are in complete harmony and intend to assume the responsibility placed upon the Board by the fish and game legislation," the Chairman continued.

The Board, which convened May 5, has already adopted bylaws governing the meetings of the Board, elected a chairman, made recommendations for a Commissioner to head the department, and met the special legal counsel to the Governor on fisheries. Governor Egan and his counsel outlined the policies adopted by the Governor previous to the activation of the Board, and fisheries counsel briefed the Board on litigation now in progress over fish traps.

* * * * *

FISH AND GAME BOARD PREPARES FOR STATE CONTROL: The Alaska Board of Fish and Game adjourned on May 11, 1959, after providing for immediate assumption of State fish and game control, should Federal authority be successfully challenged in the courts.

The Board laid the groundwork for State control by declaring that an emergency now exists with regard to the question of jurisdiction over fish and game in Alaska. The Board also declared the constitutionality of the Westland amendment to the statehood act is seriously questioned, with the public well aware of it and that, further, this constitutional question raises doubt as to the legality of Federal control of Alaska fish and game.

In a series of resolutions the Board further declared that should Federal control be successfully challenged, a possible enforcement hiatus could encourage violations of the existing laws and regulations.

For the foregoing reasons the Board found it necessary to prepare to assume, at a moment's notice, state control of fish and game.

Therefore the Board prepared, by resolution, to confirm at moment's notice a full complement of rules and regulations to govern the fishing industry of Alaska by the state agency.

In conformity with Article 4 of the Administrative Procedures Act of 1959, the Board having found that an emergency exists, as above outlined, it ordered the commercial fishery regulations of May 8, 1959, and the sport fish and game regulations of May 8, 1959, under study by the Board since it first met, to be properly identified. The rough draft material accordingly was ordered placed in special folders and signed by the Board and Commissioner as to identity.

The Commissioner was instructed to prepare from the rough drafts a set of clear copies of the regulations to be sent to all members of the Board as soon as possible.

The Commissioner, in event of emergency, has been directed to poll the Board by telegram, telephone, or the quickest means of communication possible, on the following:

- a. Do the facts as outlined constitute an emergency.
- b. Does an emergency now exist?
- c. Do you now wish to adopt the regulations of May 8, 1959?

The Board will answer by return mail.

The proposed regulations largely conform to existing Federal regulations, except where the State Constitution or legislative acts dictate otherwise.

By this means, the Board feels the general public will be appraised of the fact that State jurisdiction will immediately be assumed should Federal control be successfully challenged, with State rules and regulations largely conforming to the Federal acts now governing. Therefore, the possibility of profit by gambling on the question of lack of Federal jurisdiction will be eliminated, the Board feels.

The Board also reconstituted the old local advisory committees which existed under Territorial status, with the proviso that additional committees be appointed to represent areas now without such bodies. Fourteen committees existed under the old department.

''In the past these advisory committees have done a marvelous job of keeping a finger on the pulse of public opinion and generally providing a necessary liaison between the governing bodies and the general public,'' the Chairman of the Board said.

Guide regulations to be promulgated by the Department were discussed but final action deferred until the October meeting of the Board in order that public opinion could be heard on the matter.

"The Board welcomes any suggestions interested parties may have on these regulations. Preferably such suggestions should be in writing, in order that full and careful study can be made by all members of the Board," said the Chairman.

California

CRAB AND SHRIMP STUDIED OFF CENTRAL CALIFORNIA COAST (M/V N. B. Scofield Cruise 59-S-2): The Central California coastal waters from the vicinity of Salt Point, Sonoma County, south to Pescadero Point, San Mateo County were surveyed (March 8-April 1, 1959) by the California Department of Fish and Game research vessel N. B. Scofield. The purpose was to conduct crabtrap savings-gear tests by comparing the catches of traps equipped with one 4-inch, two 4-inch, two $4\frac{1}{4}$ -inch, and two $4\frac{1}{2}$ -inch circular escape ports. These tests were designed to determine the optimum size and arrangement of escape ports for maximum retention of legal males and maximum escapement of sublegal male and female crabs. Other objectives were: (1) to investigate the distribution and relative abundance of juvenile crabs; and (2) to investigate the distribution, size, and sex of shrimp in the Bodega Bay area through exploratory beam trawling.

Crab Escape-Port Tests: Comparison fishing trials were conducted in commercially-productive crab areas, using equal numbers of traps equipped with the four different escape-port arrangements. A total of 224 individual trap sets was made at 4 locations.

Distribution and Relative Abundance of Juvenile Crabs: Dungeness crabs were taken in 20 of 61 tows using a 10-foot beam trawl with 1- to $1\frac{1}{2}$ -inch mesh nets. Trawling with commercial size otter-trawl gear with a $4\frac{1}{2}$ -inch mesh net and a 2-inch mesh cod end resulted in crab catches at 13 of 16 locations. Catches of juveniles were low for both types of gear and areas of abundance were not located with trawl methods.

Catches of sublegal male crabs at the trap sites were uniformly low with the exception of the station southeast of Pt. Reyes. The catch of sublegals was 7.3 per trap at this station. The average catch of sublegal males was 2.4 per trap for all trap sites.

Shrimp: A total of 45 tows were made both on and off the known shrimp beds in an effort to locate shrimp concentrations. These shrimp drags were in the area from Salt Point to Point Reyes. Drags ranged in depth from 20 to 198 fathoms, with the majority in normal shrimp producing depths of 30 to 70 fathoms. No concentrations of shrimp were located although small quantities were taken in 28 of the 55 drags.

The lack of shrimp concentrations in this area at this time of year is not unique. A similar condition was noted in February and March 1957. However, the 1957 season was successful, indicating that though there is a lack of shrimp in the area early in the year, concentrations can appear later.

Carapace measurements were made and stages of sexual development were observed--51 percent of the shrimp were males, 41 percent were females, and 8 percent were transitional between males and females; 29 percent of the females were carrying eggs.

Measurements indicated an average size of 18.8 mm. for males, with modes at 13 and 19 mm. The average size of transitionals was 20.0 mm. and the average size of the females was 21.2 mm.

* * * * *

PELAGIC FISH AND BARRACUDA STUDIED OFF BAJA CALIFORNIA COAST (M/V Alaska Cruise 59-A-2): The coastal waters off central Baja California, Mexico, from Ballenas Bay northward to San Quentin Bay were surveyed (February 27-March 18, 1959) by the California Department of Fish and Game research vessel Alaska to sample the spring spawning population of sardines. Other objectives were: (1) to sample young sardines from the August-September spawning period off central Baja California; (2) to collect live sardines for genetic studies conducted by the U.S. Fish and Wildlife Service, La Jolla; (3) to sample sardine, Pacific mackerel, jack mackerel, and anchovies for determining their distribution and relative abundance; (4) to troll for surface feeding species of fish; and (5) to develop barracuda tagging techniques prior to the 1959 sportfishing season by catching and tagging whenever possible and observing mortality and tag retention in the livebait wells.

Seventy-six night-light stations were occupied. At each station fish were attracted by three 750-watt and one 1,500-watt night lights. The lights were placed on both sides of the vessel. After an hour of illumination the 750-watt lights were extinguished the 1,500-watt light was dimmed, and the Bevington blanket net was set. At times, snag

gangs and lures were used to catch fish, particularly when they were wild and tended to avoid the net.

Sardines were sampled at 10 stations, northern anchovies at 10, Pacific mackerel at 6, and jack mackerel at 5. A total of 487 miles was scouted at night between stations, and 22 sardine, 61 anchovy, 2 Pacific mackerel, and 25 unidentified schools were observed.



Fig. 1 - California Department of Fish Game's research vessel M/V Alaska.

Sardines were sampled and observed most frequently in the Sebastian Vizcaino Bay area between Pt. San Eugenio and Santa Rosalia Bay. Somelarge schools (up to 90 tons) were seen in this area. A large concentration of anchovy schools was present along the east side of Cedros Island.

Sardines were difficult to sample because of their erratic behavior beneath the light. Only two

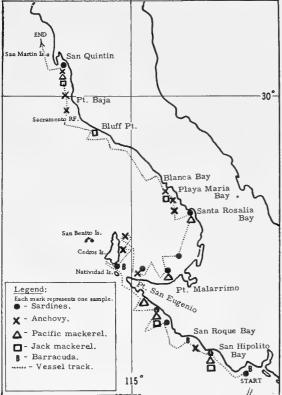


Fig. 2 - M/V <u>Alaska</u> Cruise 59-A-2 (February 27-March 18, 1959).

blanket net sets produced 50 or more fish. Many schools remained deep with a few individuals darting to the surface. Schools of this type sounded immediately, when the blanket net touched the water.

Almost all sardines examined had enlarged gonads indicating close proximity to spawning. Lengths of sardines ranged from 120 mm. to 204 mm. with modes at approximately 135 mm. and 165 mm. Larval and post-larval fish were taken at two stations near Cedros Island.

Sea surface temperatures ranged from 14.1° C. (57.4° F.) off Pt. Canoas to 18.4° C. (65.1° F.) in Ballenas Bay. Aside from these extremes, water temperatures were quite uniform, ranging from 16° C. to 17° C. (60.8° F. to 62.6° F.). In general temperatures were nearly 1° C. cooler than encountered during the same time in 1958.

Ninety-three barracuda, caught at three different locations, were tagged and placed in the vessel's bait wells. On March 2, 25 fish caught in Ballenas Bay were tagged alternately with spaghettiloop tags (13) and tuna dart tags (12). Twenty-one caught off Asuncion Island on March 5 were tagged in the same manner (10 loop and 11 dart). Off Cedros Island on March 8, 47 were tagged (22 with a toggle-type, 21 with darts and 4 with loop tags). The 93 fish ranged in length from 21 to 30 inches,

All the fish were caught with small barbless feather lures. While being tagged, they were held to prevent movement. The dart and toggle tags were placed above the lateral line between the two dorsal fins. The loop tags were inserted slightly posterior to the second dorsal fin.

Only four fish (4.3 percent) died during the cruise. Three of the 44 fish containing dart tags and one of 27 with loop tags succumbed.

A decrease in the abundance of giant kelp (Macrocystis) from the previous summer was noted. Kelp beds off Asuncion Island and the mouth of Turtle Bay had nearly disappeared. Other beds were less dense than usual.

* * * * *

AERIAL CENSUS OF COMMERCIAL FISHING CONTINUED: Airplane Spotting Flight 59-4: The inshore area from the Mexican border to the Oregon border was surveyed from the air (March 23-26, 1959) by the California Department of Fish and Game Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

Although weather conditions were not ideal, some coverage of the entire California coast was possible during the four days devoted to the survey. Visibility north of San Simeon ranged from fair to poor, while atmospheric conditions south of San Simeon were fair to excellent. Strong winds, broken clouds, rain, and low overcast were encountered along the central and north coasts.

Only a few pelagic fish schools were in evidence. No schools were seen north of Morro Bay and only three small unidentified schools were observed south of Newport Beach.

Eighty anchovy schools were present in Estero Bay, between Morro Rock and Estero Point from 1 to 3 miles offshore. All were medium to large in size and were compact and dense in appearance. Sixteen similar anchovy schools were present in the area between Morro Bay and Pt. Arguello and 16 more schools were seen near Santa Barbara.

From 1 to 2 miles offshore between the Santa Monica breakwater and the Malibu pier, 71 anchovy schools were counted. Like those at Morro Bay, they were dense and well defined.

Twenty-nine small, scattered schools of anchovies were observed south of Santa Monica Bay, 4 off Huntington Beach and 25 off Newport Beach.

Generally, dirty water prevailed along the coast, ranging from turbid grey-green and brown to a typical red-tide condition. In Los Angeles-Long Beach Harbor it was red-brown in appearance and

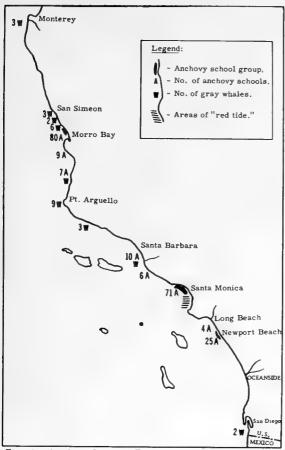


Fig. 1 - Airplane Spotting Flight 59-4 (March 23-26, 1959).

dirty brown water was present from Pt. Fermin to Redondo Beach. An outbreak of red tide was observed between Redondo Beach and El Segundo. It consisted of several "tomato-red" streaks running from shore to about one mile offshore. During the week of the survey, Marineland of the Pacific reported concentrations of 10 million dinoflagellates (40 percent Noctiluca sp.) per liter of water in the Palos Verdes Peninsula area.

A total of 44 northbound grey whales was seen; 5 were actively feeding on 7 small "swarms" of euphasilds one-half mile off the town of Mendocino.

Airplane Spotting Flight 59-5: The survey to determine the distribution and abundance of pelagic fish schools was continued (April 13-16, 1959) by the Department's Cessna 170 along the inshore area from the Mexican border to the Russian River.

Poor visibility again hindered observations north of Los Angeles Harbor, but conditions were excellent during the day spent scouting south of there.

Only 24 schools were sighted north of Point Conception; 18 were sardines and were observed off Lucia (between Piedras Blancas and Pt. Sur). All were large, well defined spots. Six mediumsize anchovy schools were present just outside Morro Rock.

What appeared to be a large concentration of sardines was noted between Point Conception and a point a few miles north of Goleta, extending one to four miles offshore. Schools within this group were deep and varied in size. Some were small spots, but the majority were quite large and dense. Positive identification was difficult, but these schools were in clear blue water and behaved in a manner typical of sardines.

Three small school groups of anchovies were observed between Goleta and Point Mugu. Each was within one mile of shore and was composed of a thin, stringy, almost continuous mass of fish. In the case of the group seen off of Ventura, an approximate count of the number of schools was impossible,

Los Angeles-Long Beach Harbor contained 153 anchovy schools, the majority at the San Pedro end of the harbor.

A large concentration of anchovies was present between Seal Beach and Newport Beach. These fish were noted in the surf line and offshore to about one mile. The water in the area was dirty green-brown in color.

Eleven scattered sardine schools were seen between Newport Beach and La Jolla.

Forty-one anchovy schools and three schools of yellowtail were counted between Mission Bay and Point Loma.

Thirty-one anchovy schools were observed close to shore along the Coronado Strand.

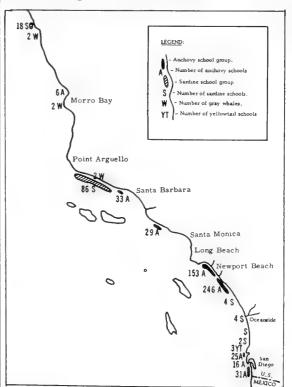


Fig. 2 - Airplane Spotting Flight 59-5 (April 13-16, 1959).

Only six gray whales were sighted during this flight. A female and calf were resting at the surface in a kelp bed about one-quarter mile offshore near Gaviota.

The water in the inshore area of Santa Monica Bay was again quite dirty, but no intense outbreak of red tide was observed.

Airplane Spotting Flight 59-6: The coastal waters from Monterey to the California-Oregon border were surveyed from the air (April 15-16, 1959) by the Department's Cessna 180 to determine fishing localities and relative fishing intensity of the northern California crab fleet.

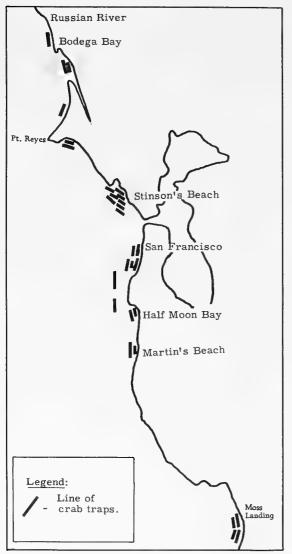


Fig. 3 - Flight Report of <u>Cessna</u> <u>180</u> (59-6--April 15-16, 1959).

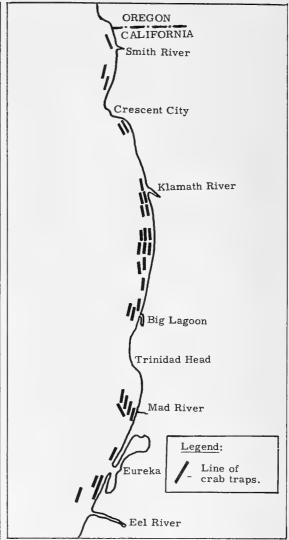


Fig. 4 - Flight Report of Cessna 180 (59-6--April 15-16, 1959).

Strong northwest winds and heavy seas hampered observations of crab trap buoys in the survey area north of the Golden Gate. Adverse flying conditions forced the abandonment of observations in the area between the Eel River and Point Arena.

Thirty-four trap lines were sighted in the area between the Eel River and the Oregon border, the majority in shallow depths. Concentrations of gear were found between the Klamath River and Big Lagoon.

Twenty-nine lines of crab gear were observed between the Russian River and Martin's Beach, with the greatest concentration off Stinson's Beach in shallow to moderate depths. Four lines were seen in Monterey Bay off Moss Landing.

Note: Also see Commercial Fisheries Review, March 1959, p. 26; and June 1959, p. 28.



Canned Fish

SHIPPING METHODS STUDY: A survey of canned fish distribution in the United States for the period July 1-December 31, 1958, has been made by the Bureau of the Census of the U. S. Department of Commerce. Arrangements have been made by the U. S. Bureau of Commercial Fisheries to obtain information on transportation aspects, or shipping methods used to ship those products.

The Bureau is financing an analysis of the data obtained, so as to provide information on the average length of haul, freight rates, and volume shipped to the various rail freight-rate territories of canned tuna, salmon, and sardines. Separate tabulations will be made for each one of those canned fishery products. A supplementary tabulation will show percentage distribution of the number of shipments by size of sales invoice and by type of carrier for all the larger packers canning each one of those products. The study is expected to be completed late in the summer of 1959. Subsequently an analysis for the first six months of 1959 may be undertaken.

Cans--Shipments for Fishery Products, January-March 1959



Total shipments of metal cans during January-March 1959 amounted to 19,450 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 23,189 tons in the same period a year ago. Canning of fishery products in January-March this year was confined largely to tuna and Gulf oysters. The decline in the shipment of metal cans during January-March this year as compared with the same period

in 1958 may be due to lighter advance orders for cans for the 1959 salmon canning season.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Clams

STUDIES DEVELOP SOURCE OF SEED AND PLANTING TECHNIQUES: Days of plenty for the people of two continents who like hard-shell clams seem to be in the making. Two developments are climaxing years of hard work on the part of biologists of the U.S. Bureau of Commercial Fisheries, the Bureau announced on April 30.

One is that a source of "seed" has been proved and can be developed. The other is proof that "seed" can be planted under conditions which will assure clams of the littleneck or cherrystone size a year after spawning.

The story in brief is a victory over the numerous predators which attacked the clam at every cycle of development. The big problem in hard-shell clam propagation has been getting the seed. Oyster set could be secured in many places but not so with hard-shell clams. The clam fishery was dependent entirely upon natural sequences, many of which were not so good.

Eight years ago, scientists at the Bureau of Commercial Fisheries' shellfish laboratory at Milford, Conn., began work on producing clam "seed" from parent

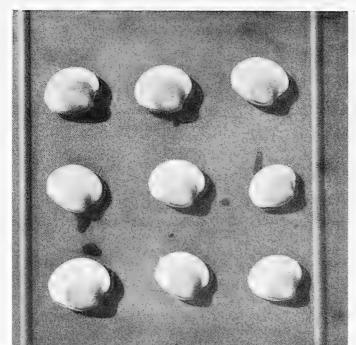
clams held in the laboratory. That task has been successfully completed and a technique for captive culture has been devised. The laboratory-spawned clams have

been planted in predator-protected areas and have thrived.

The result is that the Milford laboratory has shipped upwards to a million of these tiny creatures to various parts of the Atlantic coast to investigate their rates of growth and survival under widely different environmental conditions.

Clams--one-sixteenth of an inch long--which the Milford laboratory shipped to Florida State University for planting in warm Gulf waters under predator-free conditions developed into 2.5-inch restaurant-size specimens in just a year. In colder areas it takes as long as 3 or 4 years for clams to make that growth.

The laboratory also has just recently shipped 150,000 small hatchery-bred clams to England and France for a new start in the clam fisheries in those countries.



New Englandseed of the hard clam, <u>Mercenaria mercenaria</u>, transplantand France for a new start in the ed to Florida grew new shell (white portion) during January-March 1959. clam fisheries in those countries.

Thus the long hours at the laboratories have not only shown the clam industry how to produce seed clams necessary for a stable fishery but have made it possible for the producer to put his plantings in areas which can be protected from predators.

Other research by the Bureau is perfecting control methods for clam predators and improving "fences" or barriers used to keep the predators away from the clam beds. Still another study is probing the effect of silting and other water conditions upon this important shellfish.

Note: Also see Commercial Fisheries Review, June (1959), p. 33.



Crabs

GREEN CRABS CONTROLLED WITH CHEMICAL: To control the green crabs which destroy clams, the Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor is using lindane. Samples of green crabs taken in February 1959 from burrows in creek banks near Wells, Me., support previous observations that the lindane barrier was effective during the past summer months. After digging in many places along the banks within the protected area, the biologists found only five small crabs while one five-foot section of a creek outside the barrier area contained about 200 crabs of all size classes.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1959: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department

of Defense, 2.2 million pounds Table 1 - Fresh and Frozen Fishery Products (value \$1.0 million) of fresh and frozen fishery products were purchased in April 1959 by the Military Subsistence Market Centers. This exceeded the quantity purchased in March by 8.2 percent, but was 2.0 percent under the amount purchased in April 1958.

	Purchased by Military Subsistence Market									
	Centers, April 1959 with Comparisons									
		QUAN					LUE			
i			Jan				JanApr.			
		1958				1958				
		(1,000			(\$1,000)					
	2,188	2,232	7,137	7,256	982	1,190	3,782	4,142		

The value of the purchases in April 1959 was lower by 16.7 percent as compared with March and 17.5 percent less than for April 1958.

During the first four months of 1959 purchases totaled 7.1 million pounds (valued at \$3.8 million) -- a decrease of 1.6 percent in quantity and 8.7 percent in value as compared with the similar period in 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in April 1959 averaged 44.9 cents a pound, about 13.4 cents less than the 58.3 cents paid in March and 8.4 cents less than the 53.3 cents paid during April 1958.

The lower average price for purchases this April was due to a sharp drop in fillet prices and smaller purchases of shrimp and oysters.

Table			l Fisher					У			
	Military Subsistence Market Centers,										
1	April 1959 with Comparisons										
		QUA	YTITY			VA	LUE				
Product	Ar	oril	Jan.	-Apr.		ril	JanApr.				
	1959			1958	1959			1958			
		.(1,00	0 Lbs)		(\$1,000)						
Tuna	539	543	1,408	955	271	264	658	482			
Salmon	-	86	-	1,327	-	51	-	724			
Sardine	15	9	280	33	6	4	46	12			

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during April this year. In the first four months of 1958, purchases of canned tuna were up 47.4 percent and can-

ned sardines were up eightfold as compared with the same period in 1958. No canned salmon was purchased during January-April 1959 as compared to 1.3 million pounds in the same months of 1958.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Great Lakes Fishery Investigations

PROGRAM OF THE RESEARCH VESSEL "CIS-CO" FOR 1959: During 1959 the U. S. Bureau of Commercial Fisheries research vessel Cisco will operate along the south side of Lake Superior, east of the Keweenaw Peninsula. Primary objectives will be to determine the abundance, composition, and distribution of the fish stocks, with emphasis on lake trout and chubs.

Much of the life-history and population studies of lake trout conducted in 1953 by the Cisco will be repeated this year to determine what changes have taken place during the past 6 years of severe sea-



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

lamprey infestation. Major attention will be given the younger lake trout since information on them is least available from the commercial fishery. The small trout will be sampled with trawls and small-mesh gill nets. The abundance and distribution of spawning lake trout will be studied, when large-mesh gill nets will be set over known spawning grounds. All spawning trout and some smaller



SEA LAMPREY FEEDING ON A TROUT.

trout will be tagged and released. The lake trout data collected by the <u>Cisco</u> should add materially to the information gathered by other means so that a good idea of the present lake trout stocks and of the contribution of the hatchery-reared trout can be obtained.

Collections of trout and of other species will be made with gill nets set systematically in various areas. Sets will be mostly at 15, 25, 50, 75, and 100 fathoms, and the nets will contain the following mesh sizes: $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, and 6 inches extension measure. The information obtained from these nets may give an accurate enough picture of present populations, especially of lake trout and chubs to permit assessment in future years of the changes brought about by the anticipated drastic reduction in sea lamprey populations.

Limnological investigations will be more limited than in 1953, but some of the same areas will be sampled to detect environmental changes which might have occurred. Collections and observations will include plankton, bottom organisms, water for chemical analysis, water temperatures, Secchidisc readings, and water currents.

* * * * *

WESTERN LAKE SUPERIOR FISHERY SUR-VEY (M/V Siscowet Cruise 1): The first cruise of the U. S. Bureau of Commercial Fisheries research vessel Siscowet during the 1959 season was conducted (April 27-May 6, 1959) in the Apostle Island area of western Lake Superior. Objectives of the cruise included studies on various species of chubs, and trawling with small-mesh trawls for fry and yearling stages of whitefish, lake trout, menominee whitefish, herring, and smelt. Trawling and gill-net fishing were conducted southeast of Stockton Island, south of Oak Island, west of Michigan Island, southeast of Rocky Island, east of Manitou Island, and south of Long Island in Chequamegon Bay. A small mesh net was also towed to capture fish larva. Bathythermograph casts were made at each station.

Gill nets (1-, $1\frac{1}{2}$ -, 2-, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, and 3-inch mesh) were fished to sample various size groups of the species mentioned above. Chubs (Leucichthys hoyi and L. zenithicus) dominated the catch in 50 fathoms southeast of Stockton Island. The condition of the gonads suggested these fish had spawned last fall or early winter. The catch from nets set south of Long Island was light, consisting of very few herring, menominee whitefish, white sucker, perch, and walleye. Nets set southeast of Rocky Island caught 370 menominee whitefish varying in size from 4 to 17 inches. East of Manitou Island a set was made on a bank varying in depth

from 25 to 35 fathoms. L. hoyi, menominee white-fish, and longnose suckers dominated the catch. Seven small (6 to 11 inches) lake trout were also captured. South of Oak Island the catch from two sets consisted mainly of L. hoyi and smelt. Thirteen small (4 to 16 inches) lake trout and 16 (6 to 13 inches) whitefish were also taken.

Trawl catches were generally light. One 24-minute tow south of Oak Island took over 1,000 smeit (4 to 8 inches) and 2 small lake trout. Tows made southeast of Stockton Island took small numbers of slimy muddlers, ninespine sticklebacks, smelt, and johnny darters. Because of the poor catches in this area tows were conducted at night to determine if larger samples could be collected by trawling after dark. Nighttime trawl catches were increased by the addition of menominee white-fish to the catch. A total of 89 menominee white-fish were taken in one tow.

Tows were made with the fish-larva net over the rocky bottom west of Michigan Island. No fish were captured.

Surface temperatures varied from 35.0° F. southeast of Stockton Island to 41.5° F. south of Long Island in Chequamegon Bay. There was no evidence of stratification at any of the stations visited as temperatures remained fairly constant from surface to bottom.

* * * * *

WESTERN LAKE ERIE BIOLOGICAL RE-SEARCH CONTINUED (M/V "George L." Cruises I and 2): The U.S. Bureau of Commercial Fisheries research vessel Musky, used on Lake Erie in 1957 and 1958, was found to be unseaworthy and the vessel was destroyed after the engine and equipment were removed. A 34-foot trap-net boat, the George L., was leased for 1959 to continue biological research on Lake Erie fish.

Cruise 1 (January 1-March 1959): Thick ice formed over western Lake Erie during a severe winter but most of it had disappeared by April 1. A two-day limnological and fish population study was made through the ice near South Bass Island in February in cooperation with the Ohio Division of Wildlife. The water temperature was 34° F.; few fish were caught.

The Madtom, a 16-foot boat equipped for trawling, is used as an auxiliary to the George L. for work in very shallow water. Trawl catches by the Madtom in Sandusky Bay and Cedar Point-Huron area in March consisted mostly of yellow perch, emerald shiners, and spot-tail minnows. Few fish were found in waters less than 10 feet deep.

Cruise 2 (April 1-30): The George L. was given a test run on April 15 when several trawl tows were made off Cedar Point Beach and in Sandusky Bay. Large numbers of spot-tail minnows were taken. Many yellow perch eggs were found on a gill-net set overnight although none of the numerous female perch taken by trawl and gill net appeared to be ripe or spent. Water temperature was 47° F. Most of the perch in Sandusky Bay had spawned by

April 30, but a large percentage of the female perch captured in the lake were still full of eggs.

Samples of important species of fish in the commercial catch were taken at several ports in Ohio. The Pennsylvania Fish Commission assisted by collecting samples in Pennsylvania ports. Catches of yellow perch and sheepshead were high and catches of walleye were fair in Ohio waters. Cold water and ice greatly limited fishing in Pennsylvania and New York.

Most of the yellow perch taken in the commercial fishery of Ohio were 3 years old, but about 50 percent of the catch was less than 8.5 inches long and had to be returned to the lake. Walleyes or yellow pike taken were mostly "jumbo" or "No. 1"--few smaller fish were caught.

Environmental conditions in several areas in western Lake Erie were examined during the yellow pike and yellow perch spawning period by the Ohio Division of Wildlife and the Bureau's Laboratory.

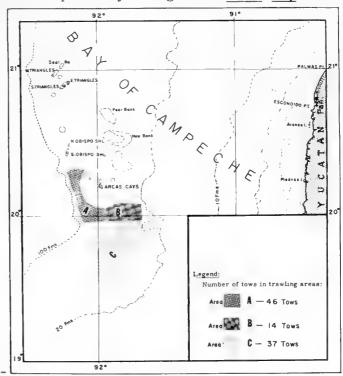


Gulf Exploratory Fishery Program

COMMERCIAL RED SNAPPER TRAWLING OPERATIONS ON CAMPECHE BANK COMPLETED (M/V Silver Bay Cruise 16): A total marketable catch of 21,471 pounds (19,166 pounds of snapper and 2,305 pounds of grouper) was taken in 18 fishing days by the U.S. Bureau of Commercial Fisheries' exploratory fishing vessel Silver Bay, while

conducting simulated commercial red snapper trawling operations on Campeche Bank in April 1959. Trawling operations were confined to three areas in the vicinity of Cay Arcas, where concentrations of snapper (Lutianus sp.) had been located during previous Silver Bay cruises. This cruise completes the programmed study of availability of red snapper to trawling gear.

A total of 97 trawl stations were completed in depths ranging from 21 to 55 fathoms. With the exception of three stations at which a new type 88-foot square trawl (no top square) was tested, all trawl stations were made with a 54-foot headrope-74-foot footrope nylon trawl rigged with 20inch rollers the full length of the footrope and fished with standard V/D rig between the doors and the trawl. The trials with the 88-foot square trawl indicated a marked decrease in catching efficiency as compared to the standard trawl.



M/V Silver Bay Cruise 16 (April 2-May 6, 1959).

The catch (see table) was comprised of five species of snapper and six species of grouper. Approximately 75 percent of the snapper were red snapper (Lutianus aya);

approximately 50 percent large (10 pounds or over), 20 percent medium (5-10 pounds) and 30 percent small fish (1-5 pounds). Negligible amounts of small, unmarketable snapper were taken due to the use of a large-mesh cod end.

Best fishing was encountered in Area A (see chart) in 38 to 45 fathoms. Forty-six trawl drags in this area produced 11,904 pounds of red snapper and 902 pounds of grouper. Catches averaged 2,000 pounds per 12-hour fishing day with individual catches ranging from 115 to 1,000 pounds per 90-minute tow. The bottom was characterized by a sand and gravel bank which sloped gently from 38 to 55 fathoms with approximately 14 miles of clear trawling bottom extending in a northwest-southeast direction. No gear was damaged or lost in this area.

Fourteen tows in Area B failed to produce profitable catches of snapper and grouper, although the bottom throughout the area was characterized by broken coral and sponge formations. A total of 1,283 pounds of snapper and 410 pounds of group-

Table 1 - Catch of Snapper and Grouper by M/V Silver Bay during Cruise 16									
Species	Common Name	Weight							
bpecies	Common wante	Total	Average	Range					
			. (Lbs.) .						
Lutianus aya	Red snapper	14,271	8	1- 20					
Lutianus analis	Mutton or king snapper	3,760		5- 22					
Lutianus synagris	Lane or rainbow snapper	624	$\frac{1\frac{1}{2}}{5}$	1- 4					
Lutianus apodus	Schoolmaster snapper	251	5 ี	2- 10					
Lutianus griseus	Gray snapper	175	20	5- 30					
Lutianus vivanus	Yelloweye or silk snapper	11	4	3- 5					
Lachnolaimus maximus .	Hogfish	74	5	2- 8					
		19,166							
Mycteroperca bonaci	Black grouper	948	15	6- 30					
Mycteroperca falcata	Scamp	628	8	2- 10					
Epinephelus morio	Red grouper	427	10	4- 12					
Garrupa nigrita	Warsaw grouper	20	12	8- 15					
Epinephelus adscensionis	Katy Mitchell or rock hind	22	3	1- 6					
Promicrops itaira	Jewfish	260	130	60-200					
		2,305							

er were taken in the 14 tows with the majority of the tows producing less than 100 pounds of marketable fish. Gear damage in the area was light and was confined to minor rips and tears.

Thirty-seven trawling stations completed in Area C resulted in a total catch of 5,979 pounds of snapper and 993 pounds of grouper. Severe gear damage was experienced in the area due to the prevalence of large coral formations and rocks, and on one occasion most of the trawl webbing and one trawl board was lost.

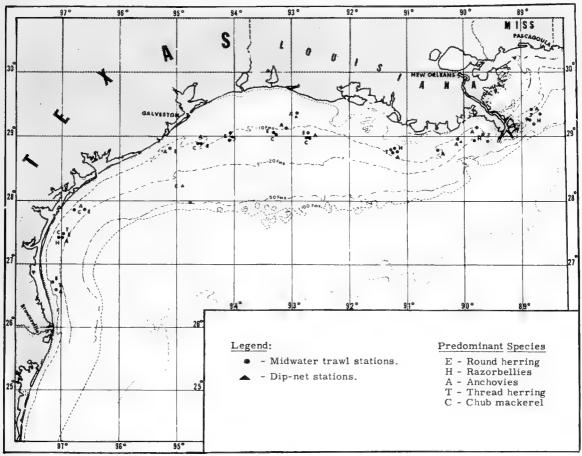
Three exploratory tows were completed on rocky and broken bottom in the vicinity of $24^{\circ}10^{\circ}$ north latitude, $97^{\circ}25^{\circ}$ west longitude in 22 to 49 fathoms. No significant catches were made in this area.

* * * * *

EXPLORATORY FISHING FOR MIDWATER FISH STOCKS BETWEEN MISSIS-SIPPI DELTA AND BROWNSVILLE, TEX. (M/V Oregon Cruise 58): The survey of available stocks of midwater fish in the Gulf of Mexico was continued by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon on a 23-day cruise that ended on April 30, 1959. During the cruise the vessel made 41 tows with 40- and 60-foot nylon midwater trawls in the 5-50 fathoms depth range between the Mississippi Delta and Brownsville, Tex.

Between Brownsville and Aransas Pass, Tex., numerous schools of mixed small thread herring (Opisthonema), razorbellies (Harengula), chub mackerel (Scomber), and round herring (Etrumeus) were encountered. All catches indicated that only small juvenile fish were present, and escapement through the meshes was heavy.

From Aransas Pass to Cameron, La., midwater fish schools were light and scattered. When sampled they yielded round herring, anchovies (Anchoa), and chub mackerel. Again all catches contained only very young fish and the apparent escapement was great.



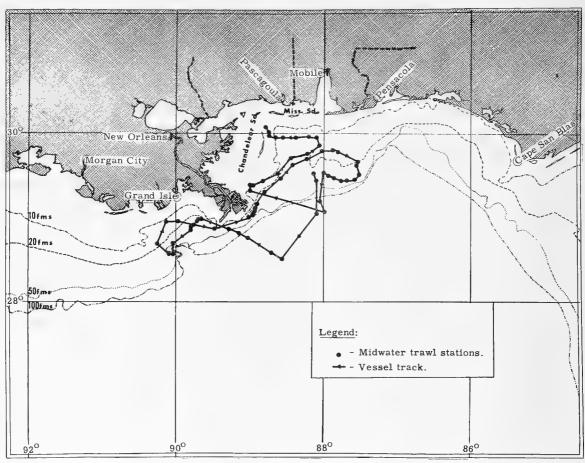
M/V Oregon Cruise 58 (April 8-30, 1959).

Between Cameron and the Mississippi Delta the schools were dispersed near the bottom. Razorbellies, thread herring, and anchovies were mixed with bottom-dwelling species. Several of these tows had up to 500 pounds of anchovies mixed in a 1,500-pound catch. The gear was subjected to some unplanned durability tests off Mississippi River Southwest Pass when two manta rays weighing approximately one ton each were caught.

Southwest of Ship Shoal numerous large schools of menhaden (Brevoortia) were seen at the surface. Efforts to catch these during both day and night drags were unsuccessful.

MIDWATER TRAWLING FOR SCHOOL FISH IN THE NORTH CENTRAL GULF OF MEXICO (M/V Oregon Cruise 59): Round-the-clock scouting transects and trawling operations, designed to provide additional information on the seasonal occurrence of school fish and their availability to midwater trawling gear, was accomplished during the May 20-27, 1959, cruise of the M/V Oregon. A total of 60 tows was made using 40- and 60-foot square midwater trawls of nylon mesh varying in size from 5 inches in the wings to $\frac{1}{2}$ inch in the bag.

With few exceptions, observed schools were confined to waters shallower than 20 fathoms, and even there concentrations of the density met with on previous U. S. Bureau of Commercial Fisheries Oregon cruises were absent. Most sets were made on light and scattered depth-recorder traces and produced catches ranging from 10 to 200 pounds of mixed anchovies (Anchoa), scad (Decapterus), razorbellies (Haren-



M/V Oregon Cruise 59 (May 20-27, 1959).

gula), and round herring (Etrumeus). Best midwater catches were obtained immediately before sunset and after sunrise when the fish schools were presumably at a point midway between their nighttime surface and daytime bottom positions. Nighttime midwater trawling was unproductive as was "blind" towing.

Near-bottom trawling, conducted east and west of the Mississippi River Delta at regular intervals, resulted in up to 3,000 pounds of mixed industrial fishes--predominantly croakers, spot, and porgies. Best near-bottom catches were obtained east of the Delta.

It is becoming increasingly evident that the art of midwater trawling differs considerably from that of bottom trawling and that comprehensive gear studies are indicated if optimum efficiency is to be obtained. Direct observation of the midwater gear by SCUBA divers is being planned for future cruises.

Numerous schools of surface fish were observed east of Pass-a-Loutre and were tentatively identified as small anchovies.

Samples were collected and frozen for future study by Service technologists.



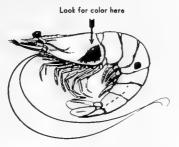
Gulf Fishery Investigations

Following are some of the highlights of the studies conducted by the Galveston, Tex., Biological Laboratory of the U.S. Bureau of Commercial Fisheries during January-March 1959.

SHRIMP: In January, a thorough coverage of shrimp landing ports in Florida was undertaken to

STAINED SHRIMP 50¢ REWARD

Shrimp have been marked with blue, green and red biological stains — in order to obtain information on migrations and growth. The color appears only on both sides of the head (in the gills) as shown in the illustration.



A reward of $50^{\frac{1}{6}}$ will be paid for stained strimp when returned with the following information:

- I. Exact place the shrimp was caught.
- 2. Date the shrimp was caught.

NOTIFY BY MAIL THE U.S. FISH AND WILDLIFE SERVICE, BIOLOGICAL LABORATORY, P.O. BOX 3098, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE SERVICE AGENT OR REPRESENTATIVE.

Stained shrimp must be verified by Fish and Wildlife Service biologist before payment. The stains used are approved for this use by the Food and Drug Administration.

Fig. 1 - Poster placed at key points in the Gulf States area encouraging the return of stained shrimp.

provide for recovery of stained shrimp released in the nursery grounds of upper Florida Bay. Fort Myers, Tampa, and all ports along the west coast were included as well as Key West and Marathon and Stock Island.

The first probable recovery of a stained shrimp was reported during this period. Four verified recoveries of stained shrimp released at Flamingo were taken on the Tortugas grounds and turned in by shrimp fishermen. The trypan blue stain used remained clear in shrimp recovered after fully 3 months and 26 days "out time." Calculated from the center of the 8-day release period and the mean release size, pink shrimp from the National Park nursery grounds grew at the rate of 3 mm. carapace length per month while moving 90 to 100 miles to the Tortugas trawling area. Stated another way, these small 120-140 count (heads-off) shrimp tripled their weight in a four-month period.

Another staining project was completed at Lower Matecumbe Key in March with the release of 4,000 shrimp taken, stained, and released on the fringe of Everglades National Park in outer Florida Bay. The first recovery from these releases near Lower Matecumbe Key showed up in the Tortugas fishery March 16, just 46 days after release. The shrimp had traveled approximately 74 miles.

At Key West it was reported that a blue-stained shrimp had been definitely picked up in the Atlantic Ocean southwest of Marathon in January--this is listed as a probable recovery since the shrimp was never turned in. This report partly confirms thinking on migration routes of pink shrimp entering the Tortugas grounds from upper Florida Bay. Large numbers probably move south through the Keys particularly at Channel Two, Whale Harbor, Tea Table Key, and Bahia Honda Key. These shrimp then move down Hawk Channel westward to the area of Marquesas Keys then north and northwestward across the Tortugas grounds.

One problem in shrimp staining has been the limitation of only three available colors. This could lead to confusion if too many releases were made in contiguous areas over a short period. By mixing stains, two additional colors, purple and brown, have been developed.

Analysis of data on seasonal changes in size and species composition of trawl hauls in Clear Lake were continued this quarter. Effort was concentrated on analyzing stomach contents of fish collected in the lake during the past year to determine the degree of predation by juvenile fishes on post-larval and juvenile penaeid shrimp.

Thus far, 1,723 fish stomachs collected from January through July 1958, have been studied. They include 870 croakers (Micropogon undulatus); 216 sand trout (Cynoscion arenarius); 26 spotted trout (Cynoscion nebulosus); 52 redfish (Scianops oscellatus); 71 spotfin whiffs (Citharichthys spilopterus); 35 spot croakers (Leiostomus xanthurus); 50 gafftopsail catfish (Bagre marinus); 13 hardhead catfish (Galeichthys felis); and several minor species numbering ten or fewer specimens each.

The dominant type food organism in the stomachs examined are listed in decreasing order of percentage frequency occurrence: copepods, mysids, fish, polychaetes, amphipods, decapods (mostly grass shrimp and crabs), isopods, and insects.

The most abundant game fish, croaker, apparently fed on penaeid shrimp to a very limited extent; major food items included copepods, mysids,



and fish. Of the other gamefishes, redfish and spotted trout did not occur in abundance at the lake except when post-larval penaeid shrimp were absent. The sand trout, also a game fish, fed mainly on mysids and larval grass shrimp and to a lesser extent, post-larval penaeids.

An interesting aspect of the results to date is that although several species of fish were present during a period of abundance of penaeid post-larvae, their stomachs contained mostly other crustacea, viz., copepods, mysids, grass shrimp larvae, and amphipods.

RED TIDE STUDIES: Studies to determine the nutritional value of specific trace metals were continued. Preliminary results indicate that media containing molybdenum, strontium, barium, rubidium, manganese, zinc, titanium, and zirconium were as good or better for the growth of Gymnodinium breve than control media with no trace metal additives. On the other hand, media containing chromium, vanadium, aluminum, nickel, and copper did not improve growth with the concentrations used.

Experiments were conducted to determine the effects of variations of the calcium and phosphorus content of media on the growth of G. breve. The results indicate that G. breve will not grow in media if the calcium content is less than .05 grams per liter or greater than 2.5 grams per liter. Within the above range, growth depends on the phosphorus concentration. More phosphorus is required if the calcium concentration is low and less phosphorus if the calcium concentration is high. These results indicate that a balance of calcium and phosphorus is required for good growth of G. breve and that

specific ratios of these elements may be necessary for blooms of this organism to develop.

Investigation of the temperature tolerance of cultures of G. breve has been continued during this quarter. The absolute low limit of temperature tolerance seems to be about 7° C. (44.6° F.)--for 10 ml. cultures maintained at a distance of two inches from a 14-watt fluorescent tube. The time required for this temperature to be lethal is apparently related to the rapidity with which the test cultures are cooled to this level.

At the other end of the tolerance range, a temperature of 30° C. (86° F.) reduced culture populations to less than 10 percent of the inital level after one week of exposure. Four hours of exposure to 35° C. (95° F.) reduced the culture populations to less than one percent of the original level. Twenty-four hours at this temperature was found to be 100 percent lethal.

Attempts to determine the effect of pH's above 8.2 on the growth of G. breve have not been successful thus far.

The screening of organic chemicals was started during the latter part of this quarter. The object of this program is to discover organics with specific toxicity to G. breve. Thus far, a dozen of the hundred or so chemicals screened have shown various degrees of toxicity. Of these, three killed all organisms within a 0.01 to 0.04 p.p.m. range.

A total of 369 samples were collected during this period and G. breve were present at 27.4 percent of the stations. The northern range of G. breve is now limited to the St. Petersburg Beach area, although G. breve were still found south along the coast to Venice and from the mouth of Tampa Bay to 40 miles offshore. No G. breve were in the fresh and brackish water samples taken in Tampa Bay. The general incidence of G. breve decreased even in the deeper neritic waters due mainly to the adverse environmental factors present during the winter months. The vertical distribution of this organism still exhibits patchy distribution and due to the low range of numbers no apparent diurnal migration can be shown.

G. breve were still present as far offshore as we sampled (40 miles) and to depths of 128 feet. It would be desirable to extend our offshore sampling, at least for spot checking to determine how far offshore this organism may occur during periods of non-red tide. The surface samples in all subareas still have the highest incidence of G. breve, 24.8 percent compared to 11.4 percent for the bottom water samples.

Concentrations of G. breve ranged from 0-200/1. The highest concentrations were again present in waters exceeding 18 feet. All stations showed a seasonal decline with the exception of Egmont Key south to Venice where a gradual increased incidence was noticed during March.

The low range in numbers follows the same pattern shown during other years (1955-1958) and probably represents the minimal population level of G, breve.

Large "butterfly" cells of G. breve were again present offshore.

INDUSTRIAL FISHES: Periodic sampling of the catches of trawlers operating out of Pasca-



Fig. 2 - Dumping fish into tanks at beginning of conveyc line at a Gulf of Mexico plant using industrial fish in caned pet food.

goula, Miss., supplying pet food plants continued as the principal activity. Present data indicate that there is a much greater variance between vessels than within individual ones as to species composition. Therefore, in order to obtain reasonably accurate determination of species composition with the man hours available for this work, it was necessary to sample as many of the vessels landing fish as possible even at a slight sacrifice of sample size within individual loads due to the small sample size adopted. The average number of species per sample, the total number of boats landed, the number of boats sampled, and the percent of boats sampled from October 1958 through January 1959 is as follows:

		1958		1959
	Oct.	Nov.	Dec.	Jan.
Average number of				
species per sample	20	22	21	14
No. boats landing	155	118	129	95
No. boats sampled	10	22	23	40
Percentage of boats				
sampled	6.5	18.6	17.8	42.1

The species composition by weight and numbers of the industrial fish catch has been determined since October. The percentages by weight of the more important species from October to February 1958-1959 are:

Demonstrate of		1959		
Percentage of	Oct.	Nov.	Dec.	Jan.
Croaker (Micropogon				
undulatus)	54.7	51,2	66.2	39.6
Spot (Leiostomus				
xanthurus)	3.0	9.1	9.8	23.0
Weakfish (Cynoscion sp.)	9.3	1.5	6.7	11.1
Miscellaneous	35.7	38.2	17.3	26.3

Maine Sardines

CANNED STOCKS, APRIL 1, 1959: Distributors' stocks of Maine sardines totaled 254,000 actual cases on April 1, 1959--39,000 cases or 13.0 percent less than the 293,000 cases on hand April 1, 1958, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on April 1, 1959, totaled 474,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), about unchanged from the 476,000 cases on hand April 1, 1958.

Cannec	Canned Maine SardinesWholesale Distributors' and Canners' Stocks,									
	April 1, 1959 with Comparisons									
	TT:4	1958	759 Se	ason			Season			
Type	Unit	4/1/59	1/1/59	11/1/58	7/1/58	6/1/58	4/1/57	1/1/58		
Distributors	1,000 Actual Cases	254	268	312	184	237	293	230		
Canners	1,000 Standard Cases 1/	474	891	1,037	386	235	476	1,111		
1/100 33-oz. cans equal one standard case.										

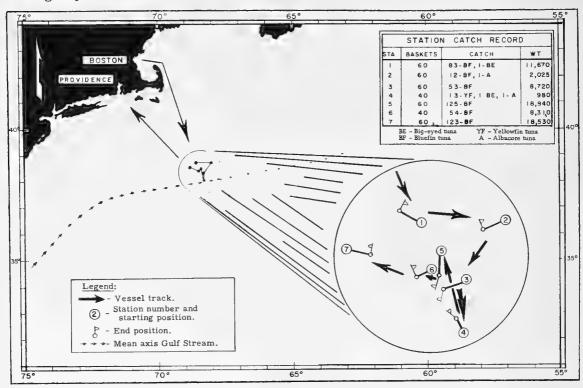
The 1958 pack from the season which opened on April 15, 1958, amounted to 2,021,000 standard cases as compared with 2,117,151 standard cases in 1957.

The supply as of April 1, 1959, totaled 2,434,000 standard cases, or 4.3 percent less than the total supply of 2,543,000 cases as of April 1, 1958. Shipments from April 15, 1958, to April 1, 1959, amounted to 1,960,000 standard cases as compared with 2,067,000 cases from April 15, 1957, to April 1, 1958.



North Atlantic Fisheries Exploration and Gear Research

GOOD CATCHES OF TUNA TAKEN ON EDGE OF GULF STREAM SOUTH-BY-EAST OF NANTUCKET (M/V Delaware Cruise 59-6): Commercial quantities of tuna were found to be readily available to long-line gear in an area on the edge of the Gulf Stream about 140 miles south-by-east of Nantucket, during a May 18-29 cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. In seven fishing days, the vessel caught about 35 tons of tuna (mostly blue-fin) on about two-thirds of the amount of gear which would be used on a commercial fishing trip.



M/V Delaware Cruise 59-6 (May 18-29, 1959).

The specific objective of the cruise was to explore for concentrations of tuna, in a limited area, along the north edge of the Gulf Stream approximately 140 miles south-by-east of Nantucket Lightship. The location was determined by analysis of data obtained during previous long-line fishing explorations by the <u>Delaware</u>.

Seven long-line sets were made during this cruise, and a total of 380 "baskets" of gear were fished. Each basket of gear was of standard 10-hook commercial type. At Stations 1, 3, 5, 6, and 7 (see chart), 33 tons of bluefin tuna (Thunnus thynnus) were caught in five days of fishing utilizing only 280 baskets of gear. This was a catch rate of 15.6 bluefin per 100 hooks. The surface temperatures at these stations ranged from 51° F. to 63.5° F.

The southermost station (lat. 38°06' N., long. 68°16' W.), located near the axis of the Gulf Stream, yielded three species of tuna: yellowfin (Thunnus albacares), big-eyed (Thunnus obesus), and albacore (Thunnus alalunga). No bluefin tuna were taken at that station. The surface water temperature was 73° F.

No gear loss or significant damage was experienced during the cruise. Relatively few sharks were caught and only one tuna was shark-bitten. Notable was the absence of the white-tip shark (Pterolamiops longimanus) even in the warmer waters where yellowfin were taken. Previous cruises have shown that later in the season this species is one of the commonest sharks in the area.

The bluefin tuna averaged about 150 pounds; the size range was from 120-450 pounds. Yellowfin tuna taken at Station 4 ranged from 30-130 pounds each.

Bathythermograph casts were made at each station to determine subsurface temperatures. Evidence from the bathythermograph traces indicated the presence of a convergence of cool water with the warmer water of the Gulf Stream.

A total of 97 bluefin tuna were tagged with plastic dart tags and released. Tagging operations, in addition to other biological collections and oceanographic observations, were conducted in cooperation with the Woods Hole Oceanographic Institution.

At the conclusion of the cruise, 25 tons of tuna were unloaded and placed in storage at Providence, R. I.



North Pacific Exploratory Fishery Program

DEVICES TO IMPROVE OTTER-TRAWL PERFORMANCE TESTED (M/V John N. Cobb Cruise 42): Several recently-developed devices designed to provide data on otter-trawl performance and bottom conditions were tested during a three-week cruise (ended May 1, 1959) of the U.S. Bureau of Commercial Fisheries exploratory fish-

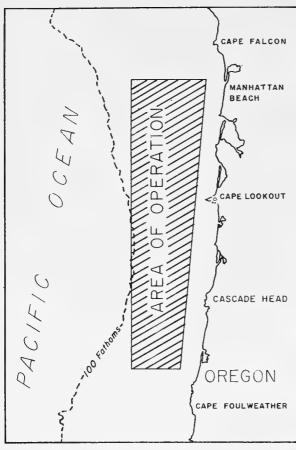
ing vessel John N. Cobb. In addition, a cooperative tagging program was carried out with biologists of the Oregon Fish Commission.

The instrumentation studies included tests of a new electrical trawl cable designed to monitor and telemeter information from the fishing gear on the ocean floor to the bridge of the vessel. The cable, which has the dual purpose of operating as a standard trawl warp for fishing gear and for carrying electrical impulses, performed satisfactorily and no conductor breakages were noted during operations. Information telemetered through the cable included a measure of the depth at which the net is operating, the temperature of the water at the net, and information on the performance of the fishing gear. The latter information, which is monitored by a newly-designed "on-bottom-indicator," shows via a light on the bridge



Fig. 1 - The Bureau's exploratory fishing vessel $\underline{\text{John }N}$. $\underline{\text{Cobb}}$.

of the vessel when the trawl doors reach the bottom and whether or not the net is fishing on the ocean floor. When the doors are functioning properly, a light flashes



M/V John N. Cobb Cruise 42 (April 1959).

on in the pilothouse of the vessel. If the trawling speed is too fast or currents are encountered which alter the performance of the gear (causing it to lift from the bottom), then the circuit is broken and the light on the bridge goes off. This new device could be of considerable value to commercial trawlers and eliminate much of the guesswork from trawl fishing.

Another device perfected during the cruise was an automatic bottom sampler with a quick release device for easy attachment and removal from a trawl door. When the trawl door contacts the bottom the instrument scoops up a sample of the bottom and automatically closes and retracts. The device will allow fishermen or scientists to be accurately informed about bottom types in areas they fish.

A cooperative tagging program was conducted off the Oregon Coast in the vicinity of Manhattan Beach and Ocean Lake. A total of 5,102 tagged fish were released in two weeks of fishing. Of this total, 4,565 were English "sole" and 537 petrale "sole." Biologists from the Oregon Fish Commission hope that this tagging experiment will assist in determining the migrational habits of those species.



Salmor

CALIFORNIA PLANTS MARKED KING SALMON FINGERLINGS: The first phase of an investigation into the life history of the king salmon was completed late in May 1959 by the California Department of Fish and Game biologists. The investigation is designed to learn why the valuable sport and food fish has declined in recent years and what, if anything, can be done. It is hoped the project will ultimately point out ways of improving salmon fishing.

"It will be no overnight project," the Department's Director cautioned. "Because the life cycle of the king salmon is approximately four years, we cannot expect any real results from the first experiment until at least 1962."

The first experiment consisted of releasing one million tiny king salmon (2 to 3 inches long), bearing distinctive marks, at three places in the Sacramento River. This large-scale, complex operation began and ended in less than two months. Next year the number of marked fish released will be doubled.

Primary purpose of the first phase of the project is to measure differences in survival of fish released at various distances from the ocean. Effects of the differences will be measured as those fish appear in sport and commercial landings and on the spawning beds.

"While a more comprehensive project is planned for each of the next four years, practical problems arising from this year's work must first be solved if we are to succeed," the Director stated. He pointed out the results of this year's experiment were far different than the experience learned in a preliminary test the Department conducted in 1958.

"A few thousand fingerlings were transported last year from fresh to salt water in live-bait tanks aboard a boat and survival was nearly perfect, almost 100 percent," the Director reports.

"Using essentially the same technique and the same boat we found that survival this year ranged from 30 percent to 90 percent," he stated. "Our scientists have not yet pinned down the reasons for such a wide variation."

Another group of fish was trucked directly to the salt-water release site. Once there, salt water was pumped into the truck tank until fish were in water of the same salinity and temperature as that into which they were released. Six different lots received this treatment and their survival ranged from 10 percent to 40 percent.

On the other hand, survival of the two groups released at different places in fresh water has averaged about 90 percent.

Since quick transportation, with high survival, is essential to the success of the project, California biologists will continue experiments to try to solve the problem this year.

Personnel stationed at the U.S. Fish and Wildlife Service's Coleman Hatchery, located on Battle Creek near Redding, produced the fish and provided facilities for Department personnel to do the marking. In addition, the Federal agency trucked one-fourth of the marked fish to Hamilton City (near Chico) for release. Department personnel and trucks transported the remaining 750,000 marked fish to either Rio Vista or Tiburon (near Sausalito) for release.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1959: Oyster Research: All experimental oysters showed a moderate amount of growth during the first quarter of 1959, but considerably more than during the comparable period of 1958. Less than one percent died. Last year for the same period of time it was about five percent. This coincided with the extreme cold.

Seed oysters brought from Long Island in November grew at about a comparable rate as South Carolina seed. The New England seed suffered no greater mortality than young local oysters.

In February, a trunk was placed under the causeway between the two larger experimental ponds. This will allow the use of water from either pond for flushing the other pond when it is drained. A trial of this system in the latter part of March indicated its practicability, and it should be very helpful in controlling silting, one of the greatest problems connected with pond cultivation of oysters.

Shrimp Research: Experimental trawl hauls were made regularly throughout the quarter. The results have been tabulated, and compared with the catches made in 1958 and with the mean catch for a comparable time from 1953 through 1956. The cold winter of 1958—the coldest in 25 years—decreased the availability of the catch. This year shows a remarkable recovery. Croaker, shrimp, and crabs are

more abundant than before the freeze. If there is a cause-effect relationship between the availability of shrimp in this quarter with the catch the following fall, then this should be a good year for white shrimp. There is the possibility, however, that the excessive rains of this March (over 6 inches in 12 hours) will upset any favorable balance due to increased availability of shrimp this quarter.

Crab Research: Again this year biologists from the U. S. Bureau of Commercial Fisheries Laboratory at Beaufort, N. C., have joined forces with Bears Bluff Laboratory to tag mature blue crabs. Over 2,000 crabs were tagged in March. Approximately a third were tagged and released near the mouth of Five Fathom Creek, 25 miles north of Charleston. A third were released in the immediate vicinity of Charleston Harbor, and the remaining third were handled near the mouth of the North Edisto River. Fishermen are urged to return these tags to help increase knowledge about the movement of crabs. The tagging work last year indicated that although most of the crabs were caught near where they were tagged, some crabs moved a considerable distance. (Progress Report No. 39, January-March 1959, of the Bears Bluff Laboratories, Wadmalaw Island, S. C.)

Note: Also see Commercial Fisheries Review, February 1959, p. 32.



Spot

ABUNDANCE IN CHESAPEAKE BAY PREDICTED LOWER IN 1959: Although 1959 will probably be a poor year for catching spot (Lelostomus xanthurus) in great numbers, the chances of catching an oversized one are the best in many years, according to a marine biologist at the Virginia Fisheries Laboratory. Since 1955 Virginia biologists have been studying this species from its early development through the nursery areas and into the commercial fishery.

The sport and commercial fishery for spot is generally supported by two-year old or younger fish. From their abundance in monthly trawl surveys and from scale readings to determine the ages of fish in the commercial catch, the biologists here found that spot hatched in the winter of 1955/56 met with unusual success, and unusually great numbers were present in the Bay the following spring and summer. Many large spot appeared in the fishery in 1958, survivors of that successful spawning.

"It is unusual to find spot past three years old in the commercial catch," the biologist stated, "but because of the high abundance of young fish in 1956 a larger than usual number should appear this summer, so that fishermen have the best opportunity in years of catching a fish of record size. Because the abundance of young spot decreased in 1957 and 1958, not as many will be available to fishermen this summer as last year. Seventeen times as many small spot were taken in samples collected by the Laboratory biologists in 1956 as in 1957, and three times as many as were present in 1958."

The biologists estimate that not more than 15 percent of all of the spot present in Chesapeake Bay and its rivers are caught annually by commercial and sport fishermen, and that approximately 60 percent die from predation, disease, and other natural causes, or leave the Bay. This indicates that the number of fish taken by the fishery has a relatively small effect on catches in subsequent years. "When natural conditions favor the larval and young fish, there are plenty for all fishermen," the biologist stated.

Spot make a very rapid growth during their first two years. At the end of the first summer they average about 5 inches, though some may be as much as 7 inches long, but by the end of the second summer they average nearly 9 inches, and weigh

about a half pound. That little or no growth occurs during the winter months has been proved by sampling the winter trawl fishery.

Biologists at the Virginia Fisheries Laboratory are confident that through their sampling devices they can give fishermen an accurate prediction of the relative abundance of spot at least a year in advance.



Standards

PROPOSED STANDARDS FOR FROZEN COD FILLETS AND BREADED PORTIONS REVIEWED AT MEETINGS: United States Standards for Grades of (1) Frozen Cod Fillets and (2) Frozen Raw Breaded Portions--prepared by the U. S. Bureau of Commercial Fisheries after careful consideration of all data and views submitted by individual members of industry, trade associations, and from other sources--were the subject of further review at a series of public meetings held between June 9-15, 1959.

These standards are designed to serve as a convenient basis for sale in whole-sale transactions, for establishing quality-control programs, and for determining loan values on stocks. They will also enable inspection and grading of these commodities by the Federal inspection service of the Bureau, which service is available for the inspection of other processed fish products as well.

It is the policy of the Bureau to build standards of quality that (1) will accurately represent differences in market value; (2) will bring about a uniform quality description in simple, easily understood terms upon which satisfactory trading can be effected; and (3) may be useful in establishing quality-control programs.

The proposed standards for frozen cod fillets and frozen raw breaded portions were reviewed at public meetings in Boston on June 9, 1959, in Chicago, June 11, 1959, and in Seattle on June 15, 1959. Following the final review of the proposed standards for frozen cod fillets and frozen raw breaded portions, taking into consideration the comments received, the standards will be published in the Federal Register.

Packers, brokers, distributors, users, and other interested parties were invited to attend the meetings or send in comments on the proposed standards.



Transportation

EXEMPT TRUCKING OF FRESH AND FROZEN FISHERY PRODUCTS UNDER STUDY: A study of "exempt trucking" of fresh and frozen fish and shellfish is being

made by the U.S. Bureau of Commercial Fisheries. The firm awarded the contract to make the study will interview about 350 shippers and 200 carriers of fresh and frozen fishery products in 28 states covering all producing areas of the country.



Little is known about the transportation of fresh and frozen fishery products. Motor carriers are not subject to economic regulation by the I. C. C. when trans-

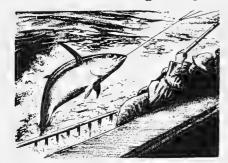
porting these products. Therefore, there is no reporting of movement of such items as to number of vehicles and tons carried, nor is there a requirement to publish rates and adhere to specific routes. This exemption from regulation is based on the fact that those fishery products are perishable and production is seasonal and cannot be scheduled. These requirements preclude their movement by firmly established routes or on established schedules.

The objective of the study is to ascertain the significance of "exempt truck" transportation to fresh and frozen fish and shellfish producers, dealers, and processors. The study will be mainly concerned with the value of the service rendered by the exempt truckers as compared with the regulated service.



Tuna

CALIFORNIA CAPTAIN FISHING OUT OF PUERTO RICO REPORTS TUNA PLENTIFUL IN EASTERN ATLANTIC: A San Diego tuna vessel captain fishing out of Ponce, Puerto Rico, says that tuna are plentiful in Eastern Atlantic. The captain returned to San Diego in April for a visit after making a pioneering voyage to Afri-



can waters on the 148-foot clipper Chicken of the Sea. The vessel is owned by a California fish cannery and is 1 of 8 former California clippers now fishing for the company's cannery in Ponce, Puerto Rico. The San Diego captain is on his second voyage to west African waters, together with one or two other boats from the same company.

He said that the vessel's 17-man crew caught 450 tons of tuna in 14 days of fishing. Most of the 110-day trip, he said, was spent making courtesy calls on government officials in ports along the

west coast of Africa in preparation for more visits by the company's clippers.

"We saw tuna every day from the time we left Puerto Rico till we reached the African coast," he said. He reported that there was plenty of herring to be had for bait near the African coast.

Most of the catch was made about $100\ \mathrm{miles}$ south of Dakar and about $120\ \mathrm{miles}$ offshore.

At times, he reported, the crew poled yellowfin tuna as fast as they could pull them in. The fish weighed from 40 to 60 pounds each.

Now fishing out of Ponce are the clippers American Beauty, Western Ace, Western King, American Queen, Espiritu Santo, Corsair, and Beverly Lyn, all formerly of San Diego.



United States Fishing Fleet 1/Additions

MARCH 1959: A total of 29 vessels of 5 net tons and over were issued first documents as fishing craft during March 1959--24 less than in March 1958. The Gulf area led all other areas with 9 vessels, followed by the Chesapeake with 8 vessels, the South Atlantic with 6, and the New England and Middle Atlantic areas with 3 each.

^{1/}Includes both commercial and sport fishing craft.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, by Areas, March 1959									
Tishing Crait,		rch			Total				
Area			1959		1958				
				Number)					
New England	3	1	5	3	13				
Middle Atlantic	3	-	3	3	13				
Chesapeake	8	7	21	24	99				
South Atlantic	6	9	18	32	135				
Gulf	9	27	25	62	270				
Pacific	-	6	8	19	112				
Great Lakes	_	-	3	2	10				
Alaska	-	3	2	3	31				
Virgin Islands	-	-	-	1	1				
Total	29	53	85	149	684				
Note: Vessels assigned to the variou	s sections	on the b	asis of th	eir home	ports.				

Table 2 - U. S. Vessels	
Issued First Documents	
as Fishing Craft, by	
Tonnage, March 1959	

Net	T	Number			
5	to	9	•		11
10	to	19			8
20	to	29			3
30	to	39			5
40	to	49			1
180	to	189			1
To	ota	Ι.,			29

From January-March 1959, a total of 85 vessels were documented as fishing craft, a decline of 64

vessels as compared with the first three months of 1958. Most of this decline occurred in the Gulf area with 37 vessels documented as compared with the 1958 three-months period.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, FEBRUARY 1959: Imports of edible fresh, frozen, and processed fish and shell-fish into the United States during February 1959 decreased by 17,5 percent in quantity and 14,1 percent in value as compared with January 1959. The decrease was due primarily

United States Foreign Trade in Edible Fishery Products, February 1959 with Comparisons									
		Quant			Valu	ie			
Item		Feb.			b.	Year			
	1959	1958	1958	1959	1958	1958			
	(Mill	ions o	f Lbs.)	. (Mi	llions	of \$) .			
Imports: Fish & shellfish: Fresh, frozen, & processed!	72.5	62.3	956.8	21.3	18.3	278.4			
Exports: Fish and shellfish: Processed only (excluding fresh and frozen)	3.3	2.8	41.2	1.0	0,8	15.6			
1/Includes pastes, sauces, clam chowder, and juice, and other specialties.									

to lower imports of groundfish fillets (down 10.6 million pounds) and canned tuna in brine (down 1.7 million pounds), and to a lesser degree, a decrease in the imports of shrimp and frozen tuna other than albacore. These decreases were partly offset by a 2.7-million-pound increase in the imports of fillets other than groundfish and frozen albacore tuna (up 3.6 million pounds).

Compared with February 1958, the imports in February 1959 were up by 16.9 percent in quantity and 16.4 percent in value due to higher imports of frozen albacore and other tuna (up 12.0 million pounds), and frozen shrimp (up 3.0 million pounds). Compensating, in part, for the increases was a drop of about 3.6 million pounds in the imports of groundfish and other fillets.

United States exports of processed fish and shellfish in February 1959 increased by 38.2 percent in quantity and 25.0 percent in value as compared with January 1959. Compared with the same month in 1958, the exports in February 1959 were higher by 19.8 percent in quantity and unchanged in value. The exports this February as compared with the same month in 1958 were up due to increased exports of California sardines.

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EDIBLE FISHERY PRODUCTS, MARCH 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1959 increased by 12.1 percent in quantity and 21.3 percent in value as compared with February 1959. The increase was due primarily to higher imports of groundfish fillets (up 2.2 million pounds) and canned salmon (up 3.6 million pounds), and to a lesser degree, an increase in the imports of frozen shrimp, canned sardines, and fresh and frozen salmon. These increases were partly offset by a 1.2-million-pound decrease in the imports of frozen albacore tuna.

Compared with March 1958, the imports in March 1959 were up by 22.8 percent in quantity and 10.5 percent in value due to higher imports of groundfish fillets (up 1.3 million pounds), frozen tuna including albacore (up 12.0 million pounds), and frozen shrimp (up 3.5 million pounds). Compensating, in part, for the increases was a drop of about 0.6 million pounds in the imports of canned tuna and frozen spiny lobsters (down 0.7 million pounds).

United States Foreign Trade in Edible Fishery Products, March 1959 with Comparisons								
		Quant	ity		Valı	ie .		
Item		rch	Year		rch	Year		
	1959	1958	1958	1959	1958	1958		
	(Mill	ions o	f Lbs.)	. (Mil	lions	of \$) .		
Imports: Fish & shellfish: Fresh, frozen, & processed 1/	84.1	68.5	956.8	24.3	22.0	278.4		
Exports: Fish & shellfish: processed only 1/ (excluding fresh and frozen).	7.7		41.2					
1/Includes pastes, sauces, clam chowder and juice, and other specialties.								

United States exports of processed fish and shellfish in March 1959 were up 131.9 percent in quantity and 110.0 percent in value as compared with February 1959. Compared with the same month in 1958, the exports in March 1959 were higher by 260.3 percent in quantity and 250.0

percent in value. The exports this March as compared with the same month in 1958 increased due to the better stocks of California sardines available for export to foreign markets.

* * * * *

GROUNDFISH FILLET IMPORTS, APRIL 1959: During April 1959, U. S. imports of groundfish and ocean perch fillets and blocks amounted to 19.1 million pounds—an increase of 4.8 million pounds (33 percent) as compared with the corresponding month of last year.

Iceland was the leading shipper with 7.8 million pounds—a gain of 3.1 million pounds compared with April 1958. Canada was second with 5.8 million pounds—1.3 million pounds below the same month of last year. Denmark followed with 3.7 million pounds (up 1.7 million pounds), and Norway with 1.1 million pounds compared with only 4,000 pounds in April of 1958.

During the first four months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets, including blocks, amounted to 60.6 million pounds. Compared with the same period of last year, this was a gain of 14.4 million pounds or 31 percent. Canada (22.8 million pounds) supplied 38 percent of the 1959 four-months total; Iceland 34 percent (20.8 million pounds); Norway and Denmark each 12 percent. The remaining 4 percent was supplied by West Germany, Miquelon and St. Pierre, the Netherlands, the United Kingdom,

* * * * *

and Ireland.

IMPORTS OF CANNED TUNA
IN BRINE UNDER QUOTA: The
quantity of tuna canned in brine
which may be imported into
the United States during the
calendar year 1959 at the 12½
percent rate of duty is 52,372,574
pounds. Any imports in excess



of the quota will be dutiable at 25 percent ad valorem.

Imports January 1-May 2, 1959, amounted to 14,958,862 pounds, according to data compiled by the U. S. Bureau of Customs. During January 1-May 3, 1958, a total of 12,490,111 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.

* * * * *

IMPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: First quarter trends showed further gains in United States imports of groundfish and ocean-perch fillets, tuna, shrimp, scallops, and fish meal.

Groundfish and Ocean-Perch Fillets and Blocks: Imports during the first quater of 1959 were 19 percent above the same quarter of 1958. Canadian shipments of groundfish were lower this year, but Icelandic, Norwegian, and Danish shipments were higher.

quarter of 1959 were nearly four times those of

Tuna, Fresh or Frozen: Imports during the first quarter of 1959 continued at a high level. Albacore imports were up 29 percent over the same 1958 period; other tuna, mainly yellowfin and big-eyed, were up 129 percent. Japan, by far the leading source, shipped both Atlanticand Pacific-caught tuna. In addition, shipments from Peru during the first

the comparable 1958 quarter.

Tuna, Canned in Brine: Imports for the first three months of 1959 were 32 percent higher than in the same period of 1958. The 1959 quota of canned tuna in brine which may enter the United States at the 12½-percent rate of duty was fixed at 52,372,574 pounds.

Shrimp, Mostly Frozen: Imports continued their upward trend. Receipts from abroad were 60 percent above those of the first quarter of 1958. Mexico was the leading source, shipping 55 percent of the total, Japan, with an impressive gain, followed Panama in quantity of shrimp supplied.

Lobster, Fresh, or Frozen: In the first quarter of 1959, lobster imports from Canada were 35 percent less than in the first quarter of 1958; spiny-lobster imports from other countries were 11 percent greater. Increased spiny-lobster imports from Australia and New Zealand offset decreased imports from the Union of South Africa.

Sea Scallops, Fresh or Frozen: Imports for the first three months of 1959 were double those of the same period of 1958. More than two-thirds of the increase was the result of higher receipts from Japan.

Canned Sardines: With increased shipments from Norway and Portugal, imports of canned in oil for January to March 1959 were 29 percent above those of January to March 1958. Because of greater domestic supplies of canned California sardines not in oil, first quarter imports of that product were much below imports for the first quarter of 1958.

Canned Salmon: During the first quarter of 1959, imports were up 8 percent over the same period of 1958. Japan's share of this trade rose to 94 percent; Canada's share fell to 6 percent.

Canned Crabmeat: January to March 1959 imports were 39 percent above those of the similar period in 1958. Japan supplied almost the entire amount.

Oysters (Mostly Canned): Imports during the first quarter of 1959 were 60 percent above those during the similar period of 1958. As with canned crabmeat, nearly all came from Japan.

Fish Meal: Imports during the first quarter were more than double those of the first quarter of 1958. Receipts from Peru continued at an increased rate thereby making that country the leading foreign source of this product, as it was in 1958. During the first three months of 1959 receipts from Angola and Canada were about twice those of the same period of 1958.

EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: Canned Sardines, Not in Oil: Exports for the first quarter of 1959 were about four times those of the same period of 1958. Due to the improved pilchard catch in the 1958 season, larger supplies of canned California sardines were available for export.

Canned Mackerel and Anchovies: Reduced supplies of these products resulted in lower exports as compared with the same 1958 period, and much lower compared with the same 1957 period.

Canned Salmon: During the first three months of 1959, canned salmon exports were nearly nine times those of the like period of 1958. The primary reason for the increase was exceptionally large shipments (2,131,579 pounds) to the Philippines in March 1959.

Canned Squid: During the first three months of 1959, exports were 74 percent below those of the comparable period of 1958. The Philippines, which has been the main market for this product, imported larger amounts,

Fish Oils, Inedible: Primarily as a result of lower sales to the three leading markets—West Germany, the Netherlands, and Canada—exports of fish oils during the first quarter of 1959 were 29 percent below those of the same period of 1958.

* * * * *

VALUE OF FISHING TACKLE IMPORTS HIGHEST ON RECORD: United States imports of sport fishing tackle, equipment, and parts in 1958 amounted to \$6,853,403 for an all-time high. This amount represents an 11.5-percent increase over 1957 imports and more than a fourfold increase over 1950, according to the Consumer Durable Goods Division, U. S. Department of Commerce.

Reel imports, which numbered 1,504,453, valued at \$3,593,288, acounted for more than half of the value of all tackleimports. Although 1,070,190 reels from Japan, valued at \$1,067,466, far exceeded imports from any other country numerically, the value of reels from France exceeded those

from Japan by about 47 percent. Imports of French reels in 1958 numbered 294,488 and were valued at \$1,566,334. Japanese reels averaged 99 cents each and French reels \$5,32; however, reels from Western Germany topped the average price of all at \$8,11 each. U.S. imports of West German reels numbered 22,862, and were valued at \$185,431.

Two other classes of imports exceeded \$1 million each and with the reels accounted for almost 90 percent of the year's imports: hooks, other than snelled, \$1,117,269; and the "'basket" class including snelled hooks, artificial baits and flies, and fly boxes, \$1,300,825.



Wholesale Prices, May 1959

Wholesale prices from April to May this year showed no significant change over-all, but they were somewhat lower than a year earlier. Prices for fresh salt-water fish were higher in most instances, while processed frozen fishery products prices were lower. Demand was good, but catches were unusually light for this time of year. The May 1959 edible fish and shell-fish (fresh, frozen, and canned) wholesale price index (121.7 percent of the 1947-49 average) was only 0.8 percent less than the previous month and 5.4 percent lower than in the same month of 1958.

With lower landings of salt-water fish, especially in the New England area, prices for certain fresh processed fish and shellfish products, like haddock fillets, in May rose above those reported in April, but most prices were lower than a year earlier. On the other hand, fresh-water fish prices in May were lower than in April, when higher prices prevailed because of the Jewish holidays. Since there was a very substantial drop in the landings of haddock at Boston, prices for fresh large drawn haddock rose (27.6 percent) in May, but they were lower (4.6 percent) than for the same month of 1958. With the arrival of fresh halibut on the market in May, prices for that fish were higher (4.8 percent) than in April and just slightly higher than in 1958. Salmon landings continued light in May and prices rose (1.6 percent) than in the same month of 1958. The May 1959 wholesale price index for the drawn, dressed, and whole finfish subgroup rose 2.5 percent over the

previous month, but was 1.9 percent lower than for the same month of 1958.

Among the fresh processed fish, small haddock fillets reflected the lower haddock landings in New England with prices in May 21.0 percent higher than in April, but 4.2 per-



cent lower than in May 1958. Some improvement in shrimp landings and a slight decrease in demand caused the shrimp prices in May to drop slightly below those in April and dropped 8.9 percent below May 1958. There was almost no change in the fresh processed fish and shellfish subgroup index from April to May this year, but it was 4.4 percent lower than in the same month of 1958.

Improvements in stocks and increased imports of frozen processed fishery products were the causes attributed to the

general drop in prices from April to May, and those prices were also lower than in May 1958. Frozen haddock fillet prices dropped (7.0 percent) from April to May and they were also lower (2.9 percent) than in the same period of 1958. Frozen shrimp prices at Chicago in May were lower (8.2 percent) than in April and 16 percent lower than in May 1958 when prices had reached a rather high level. From April to May 1958, the wholesale price index for processed frozen fish and shellfish dropped 6.4 percent and was 10.7 percent lower than in the same period of 1958.

From April to May there were only slight changes in the prices for canned fishery products, but compared with a year earlier the price changes were more significant. Canned salmon prices were fairly steady with indications that canned

pink salmon prices might strengthen in June. With substantial stocks and in spite of the tuna fleet tie-up on the West Coast, canned tuna prices dropped 1.8 percent from April to May and were 7.3 percent lower than in the same period of 1958. California sardine and Maine sardine prices rose in May. Export sales of California sardines picked up, while the new season for Maine sardines which opened on April 15 had not yet really started because early season landings in Maine were light. Compared to May 1958, when the available stocks were very light, California sardine prices this May were 36.6 percent lower. On the other hand, Maine sardine prices this May were 11.3 percent higher than in May 1958 because of light stocks and a good demand. The over-all canned fishery products subgroup index in May 1958 was 5.5 percent lower than in the same month a year earlier.

Table 1 - Wholesale Average Prices and Indexes	s for Edible F	ish a r	d Shell	fish, May	1959 with	Compar	isons	
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Ayg. P	rices <u>l</u> /		Index (1947-49		
			Ma y 1959	Apr. 1959	May 1959	Apr. 1959	Mar. 1959	Мау 1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.7	122.7	128.2	128,6
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, Ige. & med., drsd., fresh or froz. Whitefish,L. Superior, drawn, fresh Whitefish,L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh			.10 .35 .78 .78 .95 .60	.08 .33 .76 .98 1.08	138.1 145.5 97.0 107.0 174.1 192.1 192.1 140.7	139.6 141.9 76.0 102.1 171.3 241.7 217.4 166.5	148.8 153.6 149.2 103.1 168.5 166.1 161.8 170.0	146.0 148.3 101.7 106.7 179.8 190.9 202.2 111.4
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb, tins. Shrimp, lge, (26-30 count), headless, fresh Oysters, shucked, standards.	Boston New York Norfolk	lb. lb. gal.	.35 .86 5.63	.29 .87 5.75	136.4 117.4 136.7 139.2	136.5 97.0 137.4 142.3	145.8 161.6 143.8 145.4	142.7 122.5 150.1 136.1
Processed, Frozen (Fish & Shellfish): Fillets: Flounder, skinless, 1-lb. pkg. Haddock, sml, skins on, 1-lb. pkg. Ocean perch, skins on, 1-lb. pkg. Shrimp, lge. (26-30 count), 5-lb. pkg.	Boston Boston Boston Chicago	lb. lb. lb. lb.	.39 .33 .28 .76	.40 .36 .30 .83	119.8 100.8 103.6 112.8 117.6	128.3 103.4 111.4 118.8 128.1	133.9 106.0 124.0 118.8 132.3	134.1 103.4 106.7 118.8 140.0
Canned Fishery Products: Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, It. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Seattle Los Angeles Los Angeles	cs.	22.50 10.80 7.15		98.6 117.4 77.9 83.9	99.0 117.4 79.3 82.2	98.8 116.1 79.3 86.9	104.3 120.0 84.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.35	8.22	88.88	87.5	87.5	79.8

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.





International

FOOD AND AGRICULTURE ORGANIZATION

USE OF ATOMIC BYPRODUCTS IN PRESERVING FOODS: Studies on the treatment of some foodstuffs with relatively low dosages of ionizing radiations have advanced in Europe to a point where some practical applications of the method may be developed in the reasonably near future provided that the wholesomeness of the treated food has been assured.

A report completed by the Food and Agriculture Organization (FAO) says, in guarded and qualified language, that impressive progress has been made in the past few years in laboratory use of radiations in extending the storage life of foods and in killing undesirable organisms in food

The report is a summary of the European meeting on the use of ionizing radiations for food preservation, held in November 1958 at the United Kingdom Atomic Energy Authority's Atomic Energy Research Establishment at Harwell. It was attended by 176 representatives of 17 European members of FAO, and by 22 observers from five non-European members, and 14 international organizations,

On the basis of review papers presented by invited specialists from European countries and the United States, the meeting surveyed the present status of food irradiation, evaluated the technique's potential for European countries, and considered the need for and possibilities of organizing international cooperation in research.

The report warns that many basic problems remain to be solved before radiation treatment of foods for the extension of their storage life will be ready for widespread development and application. But, it points out, "a few possible applications of irradiation, such as the inactivation of Salmonella in egg products and of certain parasites in meat, the disinfestation of grain and certain packaged products, and the suppression of sprouting in potatoes and root crops, are approaching the stage at which commercial exploitation might be considered, provided that the wholesomeness of the treated foods had been assured."

Food irradiation was still in the stage of laboratory research in Europe but plans under way in the United States for pilot and demonstration plants ''reflect confidence in the process.''

Present indications were that treatments involving the use of substerilizating doses of radiation, rather than the higher sterilizing doses, were "more likely to lead to practical applications in the reasonably near future."

Treatment with moderate doses had produced a five-fold increase in the storage life of certain meats and meat products, fish, and some fruits and vegetables. The food poisoning organism Salmonella, frequently found in egg products, had been successfully killed in frozen whole egg pulp. The irradiation process, the report says, performs its work without appreciably raising the temperature and thereby cooking foods, and the product need not be removed from its package.

Treatment with higher doses, intended to give a sterile food in which no microbial spoilage is possible, produced changes in color, flavor, odor, and texture which were considered objectionable. This problem would have to be solved before such treatments were likely to be used on a wide scale.

The meeting agreed that the potential value of food irradiation as a method of preservation "justified considerable investment in research." It recommended that European governments encourage and support such research, and that appropriate forms of international cooperation in this research be established to reduce its cost. It asked that FAO establish a permanent technical working group on food irradiation to review developments in the field, and that the Organization set up such other technical groups as will be necessary to study the problem of formulating fundamental principles governing the use of irradiation and methods of testing irradiated foods for wholesomeness; the aim would be to evolve a common basis for legislation on the subject in individual countries, other such technical groups might be formed to study microbiological and entomological aspects of food irradiation.

* * * * *

INTERNATIONAL STANDARDS FOR CHEMICAL ADDITIVES TO FOOD PROPOSED:

A joint committee of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) has made a move towards identifying and establishing standards of purity on an international basis for commonly-used chemicals which are added to many foods.

The Joint FAO/WHO Expert Committee on Food Additives which met in Rome in December has begun to draw up provisional specifications for a number of the more important food additives, with special reference to antimicrobial preservatives (used in fruit juices, jams, etc.) and antioxidants (used for stabilization of fats and oils). Earlier meetings of the joint committee had agreed that food additives should be identifiable, and that established specifications of purity were the best means of excluding harmful impurities from food additives.

At the December meeting, delegates stated that specifications or standards of purity have been established for only a small portion of the increasing number of chemical substances which are currently added to the world's food supply.

Substances added to foods, it was pointed out, are used for a variety of purposes, among them the preservation, flavoring, and coloration of foodstuffs. The joint meeting said that the identity and concentration of major components of a food additive must be known in order to carry out an effective investigation of its properties. It drew up provisional specifications for two major groups of the most commonly-used food additives, that is the antimicrobials and the antioxidants. These specifications include the chemical name and popular synonym of each substance, its description and chemical or structural formula, the percentage of each component, proposed identification tests, and acceptable standards of purity.

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IMPROVED MIDWATER TRAWLING

METHOD DEMONSTRATED:

Promising catches of herring and sprat have been made with a new type of one-boat midwater trawl gear, consisting of a high opening nylon net, hydrofoil otter boards, and an echo-sounder oscillator attached to the headline of the net for continuous trawl depth indication and fish detection.

This method has been perfected by a gear technologist on the staff of the Fisheries Division of the Food and Agriculture Organization (FAO), Rome. It is based on experimental work carried out by him when a member of the Institut fur Netz- und Materialforschung, Hamburg.

The technologist was loaned by FAO to the Institute in December 1958 to carry out midwater trawling experiments with a typical German North Sea cutter. These boats are about 24 meters (79 feet) over-all, powered with 150 hp. engines. When trawling in midwater the cutters usually work in pairs, two boats towing one net between them. In Germany there is also a rather primitive one-boat method using conventional otter boards which are kept at the desired depth by attaching them to big surface floats. The experiments were concentrated on improving the one-boat trawl.

The main problem in midwater trawling has been to tow the net at the proper depth to catch the fish, and control the net so that it can be quickly raised or lowered as desired. The shorter the warps and the higher the towing speed, the higher the net will travel through the water. But this general rule applies only to a small degree to the one-boat trawl where the depth of the net has to be adjusted by changing the length of the strops connecting the otter boards with the surface. Furthermore, accurate adjustment of the net to the actual depth of the fish requires continuous indication of the depth of the net, so that the proper action can be taken in time.

The basic idea of the improved method is not new. It consists of attaching an oscillator (transducer) to the net and connecting it by cable to the echo-sounding unit installed on board.

An echo-sounder oscillator attached to the bosom part of the headline to sound downwards indicates not only the depth of the net but also the position of the foot-rope and the fish in the net-opening and below the net, as well as the sea bottom.

This enables the fisherman to know the depth of the net, check if the gear is operating properly, and to see if the fish in the path of the net are really caught. With some experience, he should be able to estimate the rate of catch and so determine the right time for hauling. These very obvious ad-

vantages make it much easier to accept the slight trouble of handling an extra cable.

The experimental net had an opening height of 8 to 10 meters (26-33 feet) and, to improve its manoeuverability, hydrofoil otter boards, designed by F. Süberkrüb, Hamburg, were used. These provide a good sheer at a considerably lower drag as compared with the conventional boards. The warp is attached above the center of the board which gives an inward tilt, the lift varying with the towing speed. This increases considerably the influence of speed variations on the depth of the net, and enables the captain to regulate the depth through engine control.

This new gear combination enables the captain to practice 'aimed' fishing in what has hitherto been mostly a blind operation.

The captain of the cutter chartered for the experiments was soon able to handle the gear and, since the experiments, has successfully fished with it on a commercial scale. He has often caught the same amount, or even more, than have the pair-trawl boats fishing nearby.

German deep-sea trawler companies are very interested in midwater trawling for herring, particularly as an additional method for craft of 400 to 500 British registered tons and 600 to 800 hp., which are not suitable for fishing on the distant grounds off Greenland, Newfoundland, and Labrador.

Considering the promising results of the cutter experiment, it was advisable to test this type of gear with a medium-sized deep-sea trawler, too. The experiments were carried out with a steam trawler of 4,000 BRT and 600 hp. in the northern North Sea during February 1959. A very big and light nylon trawl was made which worked with an opening height of 12 to 14 meters (39-46 feet). Basically the same echo-sounder oscillator arrangement was used but with an automatic electric winch, which was essential for handling the 400-fathom cable needed for fishing at about 110 fathoms.

The method proved to be applicable for these bigger craft and valuable experience was gained for future improvements. Catches of up to 3 1/2 tons of herring per haul were made, which were considered fairly good in view of the limited size and density of the schools present.

An interesting innovation was tested during these trials, that of an oscillator on the trawl headline transmitting concurrently up to the surface and down to the bottom. This gives the captain much better information on the actual trawl depth. Irregularities of the bottom profile may be mistaken for net movements and vice versa but the indication of the trawl's distance from the surface eliminates this difficulty completely.

The result of these experiments, financed by the German Ministry of Agriculture on request of the German fishing industry, is a big step forward in improving the technique of commercial midwater trawling.

It is likely that this method of "aimed" trawling may lead to exploiting pelagic fish resources which have not been, or only to a limited extent, fished so far.

GENERAL AGREEMENT ON TARIFFS AND TRADE

FOURTEENTH SESSION OF THE CONTRACTING PARTIES:

Important issues of international trade policy confronted the thirty-seven countries that are signatory to the General Agreement on Tariffs and Trade (GATT) when they convened in Geneva on May 11, 1959, for their 14th General Session.

Among the major issues requiring action is the United States proposal that the Contracting Parties undertake another general round of tariff negotiations in 1960.

The steady improvement in Western Europe's payments position in recent years has raised certain issues for the Contracting Parties. The GATT specifies that with certain exceptions quantitative restrictions should be used to curtail imports only when required to safeguard a country's foreign exchange reserves by bringing payments back into balance with receipts.

A third intersessional committee charged with responsibility for recommending ways to expand international trade with particular reference to the exports of less-developed countries, will submit its work program to the Contracting Parties.

The request of Yugoslavia to participate in the work of the Contracting Parties on an associate basis will also come up at the 14th Session. While not prepared to assume the full obligations of a contracting party to the GATT, the Yugoslavs would like to bring their trade and their commercial procedures more closely into line with those of the other GATT signatories, and are seeking to do so through a form of associate participation.

In addition, the Session will deal with a number of other matters including actions taken by certain Latin American countries to supplement their effective tariff rates by the imposition of surcharges, the application of Israel for accession to the GATT, further consideration of the impact of the overseas territories provisions of the Rome Treaty on the trade of third countries, a number of complaints by governments against specific actions taken by other governments, and various proposals for improving procedures.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ANNUAL MEETING IN MONTREAL:

The Ninth Annual Meeting of the International Commission for the Northwest

Atlantic Fisheries was held in Montreal, Canada, in the week beginning June 1, 1959. From May 26-30, the Standing Committee on Research and Statistics and the Groups of Scientific Advisers to Panels 3, 4, and 5 met. In order to facilitate the work of the various research groups several ad-hoc committees and the chairmen were appointed in advance to make preparations for the formal meetings.

Commissioners, advisers, and experts from the 12 member countries participated in the meeting. The Commission invited the following to send observers: The Food and Agriculture Organization; International Council for the Exploration of the Sea; International Fisheries Convention 1946; International North Pacific Fisheries Commission; International Pacific Halibut Commission; International Pacific Salmon Fisheries Commission; Great Lakes Fisheries Commission; Poland; and World Meteorological Organization.

MORE COUNTRIES TO FISH ON NORTHWEST ATLANTIC FISHING GROUNDS:

The Polish fishing industry, which has been expanding rapidly during recent years,

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expects to extend its activities to the Northwest Atlantic area this coming summer. Due to the extension of fishing to the banks off eastern North America, Poland has become interested in

the work of the International Commission for the Northwest Atlantic Fisheries. The Commission has invited Poland to send observers to the Commission's 1959 annual meeting.

The Belgiums are looking for new fishing grounds since the extension of Iceland's territorial waters to 12 miles. Recently a Belgium fishing firm sent two trawlers to test the fishing grounds off Labrador. The vessels found the grounds so rich in ocean perch stocks that capacity loads of 250 metric tons were taken in seven days.

The two trawlers are new and large enough to permit fishing trips of up to 30 days. They are fully equipped to permit filleting, freezing, and salting of the catch as well as the manufacture of fish meal. The Belgium firm plans to send smaller trawlers from its fleet to the Banks off Labrador and Newfoundland and to the Gulf of St. Lawrence as a result of the successful initial trips of the two large vessels.

Brazil has acquired three large trawlers intended for fishing on banks off the United States and Canada. A special port with processing facilities has been established to handle the catches of these vessels. This is a new venture for Brazil which has in the past imported its salt cod.

In addition to the above, Cuba has started to fish for cod in the Northwest Atlantic.

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PROTOCOL AMENDING CON-VENTION ENTERS INTO FORCE:

The protocol (dated at Washington June 25, 1956) between the United States of America and other countries, amending the International Northwest Atlantic Fisheries Convention of February 8, 1949, entered into force on January 10, 1959.

NORTHWEST PACIFIC FISHERIES COMMISSION

JAPANESE NORTH PACIFIC SALMON MOTHERSHIP QUOTA FOR 1959:

The third annual meeting of the Japanese-Soviet Commission for Northwest Pacific Fisheries came to an end on May 13, the 122nd day since negotiations began, with acceptance by Japan of a salmon catch quota in the treaty area of 85,000 metric tons. Despite Japan's initial request for a 165,000-ton quota, on the grounds that 1959 is a peak year in pink salmon abundance, she finally accepted, in the face of unyielding Soviet insistence that the salmon resources of the Far East are declining under the pressure of the Japanese fishery, a quota considerably below last year's 110,000 tons and the 1957 quota of 120,000 tons.

In addition, the Japanese consented to a number of other restrictions on their highseas fishery. The process of closing fishing grounds to Japanese fleets, which resulted in their being completely shut out from the Sea of Okhotsk at the 1958 negotiations, has now spread to the Pacific, with establishment of a new closed area north of 48° N. between the Kuriles and 160° E. The closed waters around the Komandorski Island have also been slightly widened. The Japanese have undertaken to enlarge the mesh of their nets to 65 millimeters (2.56 inches) knot-to-knot over a four-year period beginning in 1960 and to begin studies leading to an increase in net-twine diameter. The 1959 red salmon catch quota has been cut to 8 million fish from last year's 11 million, with the additional proviso that not more than 2.5 million of these are to be taken west of 165° E.

The 16 canneryships and 460 fishing boats were due to sail on May 15. The sailing may be delayed, however, unless canneryship operators and fishing vessel owners come to a speedy agreement on fish prices. Since it has not been possible to reduce the participating fleets below last year's level, despite the sharply reduced total catch limit, the fishing boat operators are seeking an increase in fish prices of about 25 percent to enable them to break even at the expected average catch per boat. In any event, it is being predicted that there will have to be a thorough reorganization and a considerable reduction of the fishery before next season, and the boat owners who expect to be squeezed out are already beginning to talk of seeking compensation from the Japanese Government, the United States Embassy in Tokyo reported on May 15, 1959.

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JAPAN PROPOSES CUT IN SALMON QUOTA AT MEETING:

A North Pacific salmon catch quota of 90,000 tons for this year was proposed by Japan May 10, 1959, at the 38th session of the Commission meeting in Tokyo. The Japanese also proposed a quota of 80,000 tons for 1960. The Russians referred the proposal to Moscow. Originally Japan had asked for a quota of 160,000 tons for this season and gradually scaled it down

to 110,000 tons. On the other hand, Russia insisted that the quota be 70,000 tons.

Japan decided to scale down her salmon quota in order to avoid prolonged negotiations because the salmon fishing
season was about to start. Japanese
salmon fishing fleets were ready to sail
from Hakodate, Hokkaido, Japan's northernmost main island, as soon as approval
was granted by the Japanese Government.

Russians told the Japanese that next year's catch should be decided on the basis of the status of the fish resources when the Commission meets next year.

On May 10 the Commission adopted two resolutions (1) urging both governments to conduct a joint scientific survey of salmon, salmon trout, herring, and crab resources, and (2) to exchange scientists and fishery experts.

By late April it was reported that, in addition to what had been agreed upon by that time, the Russians were attempting to get agreement from Japan for establishing a fish corridor stretching from the entrance to Onekotan Channel up to longitude 160° E. in the Pacific and another corridor stretching from the entrance to Urup Channel eastward up to longitude 160° E. The Russians had indicated that if Japan would agree to establishing those corridors to permit spawning salmon to migrate to the Russian streams unmolested, the Japanese salmon catch quota might be increased from the Russian proposal of 70,000 metric tons. On the other hand, the Japanese lowered their original quota of 165,000 tons to 130,000 tons.

At that time, in view of the trend of the negotiations, the Japanese salmon industry agreed to reduce its salmon mothership fleet in the North Pacific from 16 to 13.

INTERNATIONAL WHALING COMMISSION

PROTOCOL TO WHALING CON-VENTION RATIFIED BY BRAZIL:

The protocol amending the International Whaling Convention of 1946, done in Washington on November 19, 1956, has

been ratified by Brazil and deposited with the U. S. Department of State on May 4, 1959. The ratification of the protocol by Brazil completed the required number of signatory countries and the protocol entered into force on that date pursuant to Article III (2), the U. S. Department of State reported on May 5, 1959.

UNITED NATIONS

STATISTICS ON FISH LANDED IN FOREIGN COUNTRIES:

Statistics on fish landed by fishing craft of one country in ports other than those belonging to that country are treated differently by various countries. Since it is desirable that those landings be included in national fishery statistics in a uniform manner, the eighth session of the United Nations Statistical Commission in 1954 recommended as follows:

"Wherever the size of landings is of importance and wherever it is possible to do so, countries should include in their import statistics fish landed directly from foreign fishing craft and include in their export statistics fish landed abroad by 'domestic fishing craft'."

The ninth session of the United Nations Statistical Commission endorsed the proposal in 1956.

At the Food and Agriculture Organization meeting on fishery statistics in Edinburgh, Scotland, in September 1958, a review will be made of the progress the various nations have made in adopting the recommendation.

WHALING

THREE WHALING NATIONS DISCUSS ANTARCTIC QUOTA PROBLEM:

Representatives of the whaling industries of Norway, Japan, and Great Britain met in Oslo on April 24 and 25, 1959. In a release to the press by the Norwegian Whaling Association it was stated that the discussions were a continuation of the talks held in Tokyo last February between representatives of the Norwegian and Japanese industries in regard to the question of the distribution of the whale quota among the whaling nations. No agreement was reached during the Oslo discussions, but it is expected that the

matter will be brought to a conclusion at a meeting of the representatives of the Governments of Great Britain, Japan, the Netherlands, and Norway in London in the near future, the release stated.

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FOUR NATIONS FAIL TO REACH AGREEMENT ON ANTARCTIC BLUE-WHALE UNIT QUOTA:

Government and whaling industry representatives from Japan, Norway, the United Kingdom, and the Netherlands met in Tokyo May 18-22, 1959, to discuss the allocation of the 1960 Antarctic baleen whale catch among their fleets. The conference stemmed from the decision taken by the five Antarctic whaling nations at London in November 1958 to abandon the practice of free competition for the whales under an over-all catch limit set by the International Whaling Commission. Because this free competition was causing financial distress to some of the European whaling companies, it was decided at the London conference to allot 20 percent (3,000 units) of the total catch quota of 15,000 blue-whale units to the Soviet Union, on condition that the Soviet fleets would not be increased unduly in the next few years. The Tokyo conference failed to solve the problem of allocating the remaining 12,000 blue-whale units among the four other countries.

A number of preliminary meetings-one between Norwegians and Japanese at Tokyo in February 1959, one at Oslo among Japanese, British, and Norwegians late in April 1959, and one at Amsterdam between the Norwegians and Dutch early in May 1959--failed to reconcile the various claims by those nations to what they consider their fair share of the whale catch. According to Tokyo trade press sources, the most active line of maneuvering has been a Japanese attempt to induce the Norwegians to retire three fleets and sell their catch rights to Japan, with the Norwegians simultaneously trying to buy the single Netherlands whaling fleet. Each country is, of course, demanding an allocation that would guarantee profitable operation of its fleets.

It is expected that the International Whaling Commission, to which 17 nations belong (including the United States) will try to find a solution at its annual meeting scheduled for June 24 in London. At that time there will be only six days before the June 30 deadline, when the conditional withdrawals of Japan, the Netherlands, and Norway from the International Whaling Convention become effective. These conditional withdrawals were made as bargaining moves in the struggle for catch allocations, but if they are carried through, the Antarctic whale stocks will in effect be exposed to unlimited exploitation. It is generally accepted that unlimited catching would soon reduce the resource to the point where only the Statesupported fleets could afford to continue operations, the United States Embassy in Tokyo reported on May 15, 1959.

According to a dispatch from Agence France Press, the chairman of the Norwegian Whaling Council, who headed the 6-member Norwegian delegation to the non-productive Tokyo talks, said that Great Britain offered to reduce its share of the undistributed 12,000 blue-whale units from 2,250 to 2,200 units, while Norwegian negotiators indicated willingness to cut Norway's quota by 100 units, subject to government approval, to make it 5,000. The Netherlands and Japan, on the other hand, adhered to their demands of 1,200 and 4,900 units, respectively. The limit for the annual catch is set each year by the 18-nation International Whaling Commission.

Meanwhile, the Norwegian Whaling Council has published No. 41 and No. 42 of International Whaling Statistics, showing the decline in the number of blue whales caught in the Antarctic during the period between February 1 and March 4, in percentage of the combined blue whale and finback catch. In the 1931/32 season, blue whales constituted 61.9 percent of the catch. In the last season before World War II, 1937/38, the percentage dropped to 16.5 percent. Since the war, through the 1951/52 season, the percentage of blue whales varied between 31.9 and 22.9, with a radical drop in the following six seasona. In 1955/56 the blue whale percentage was down to 11.5 and for the entire 1957/58 season it was only 6.3 percent.

Note: One blue-whale unit equals 1 blue whale, 2 finbacks, 22 humpbacks, or 6 sei whales.

Aden

FISHERIES TRENDS, 1958:

During 1958 the Aden Colony Fisheries Department program for modernization of the fishing industry continued to meet with success. Three additional boats were mechanized and four more were in the process of being mechanized. The fleet of mechanized fishing vessels numbered 27 as of the end of the year. In addition, nylon nets continued to replace nets made of cotton or hemp and during the year 70 nylon nets were purchased by the fishermen.

Biological and technical studies carried out during the year indicated that good fishing grounds existed 10-15 miles offshore. The problem faced by the Fisheries Department was ways and means of inducing the conservative fishermen to give up their old habit of fishing close to shore and try new and more distant grounds. The technologists of the Department prepared and shipped a sample of pickled mackerel to Zanzibar. The shipment was well received and once the new fish processing station is completed a new export market may be developed.

The amount of cured fish produced for export increased to 3,121 long tons as compared with 2,750 tons in 1957. Fish meal exports in 1958 reached 478 tons and showed a satisfactory increase for the third year in a row. The fisheries officers are hoping that the effect of the summer monsoon season on the catch will be offset in the future by modernization of the fishing fleet, the United States Consul at Aden reported on February 26, 1959.



American Samoa

MORE KOREANS FISH FOR TUNA CANNERY:

The first Korean tuna long-line vessel to fish for the tuna cannery in American Samoa arrived early in 1958, and a second vessel arrived in September 1958. Six additional Korean vessels were reported to be scheduled to enter this fishery under contract to the tuna cannery (Pacific Islands Monthly, March 1959).

The American Samoa cannery is operated by a United States west coast tuna canning company.



Australia

TUNA FIRM CONDUCTS SURVEY OF CONSUMER EATING HABITS:

As part of a campaign to sell more fish, a New South Wales tuna canning firm with factories at Eden and Narooma, is sponsoring a survey of the eating habits of Australians. Although the survey is incomplete, early returns indicate that about 52 percent of the Australian families eat fresh or frozen fish--about three times as much fresh as frozen, and mostly prefer flathead and bream. At least 96 percent of the families interviewed eat some kind of canned fish. The complete survey will cover thousands of families and the results will be analyzed by the University of New South Wales.

Most of the big chain food stores are featuring canned tuna in weekly specials and the tuna cannery sales manager states that sales are booming. The special price for a large can of tuna is $2s.5\frac{1}{2}d$. (about 27.5 U. S. cents.)

The New South Wales tuna canning company handled about 2,000 long tons of tuna in 1958. A determined effort will be made to develop an export trade in frozen tuna to the United States. Representatives of the firm were in the United States in April surveying prospects for frozen tuna exports.

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TUNA LANDINGS HIGHER IN 1958/59 SEASON:

Landings of tuna from the late fall and winter fishery off South Australia and New South Wales were over 2,369 tons, or more than 68 percent higher than the 1,495 tons reported from the same areas the previous season. The landings in South Australia and New South Wales make up about 90 percent of the tuna landed in Australia.

Most of the tuna landed in Australia is canned or frozen. As a result of an

Australia (Contd.):

early 1959 visit of an Australian trade mission to the United States, there is some prospect that tuna shipments to west coast United States canners will be resumed. The last shipments were made on a trial basis in 1951 and 1955. As the catch of tuna in Australia is limited at the present time by lack of freezer space in Australian fishing ports, exports of all types of tuna (frozen and canned) to the United States and other countries will not exceed 2,000 tons. (United States Embassy in Canberra reported on May 6, 1959.)

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FISH CANNING INDUSTRY:

Australia imported large quantities of canned fish before World War II. During the war years, much effort was put into developing the fish canning industry. To protect its young industry, the Government imposed restrictions on the imports of canned fish. This hurt several exporting nations, especially Norway.

At present, Australia has 17 fish canning factories. Most of them were built recently and are equipped with the most modern facilities, including refrigeration units for storage. A few factories have special installations for holding fish in sea water at temperatures of 0°-1° C. (32°-34° F.), which keeps fish fresh for 7 or 8 days.

Annual fishery production in Australia amounts to about 400,000 metric tons of fish and 14,000 tons of crustaceans. Australia imports about 8,000 tons of refrigerated or frozen fish a year. Production of canned fish totals about 3,000 tons annually, but an additional 3,000 is imported each year to satisfy the demand (Industria Conserva, Vigo, Spain, January 1959).

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PLAN TO USE HELICOPTERS TO PICK UP SHRIMP FROM FISHING VESSELS AT SEA:

Helicopters may soon be used as delivery vans for shrimp from the Rockhampton grounds off Queensland, Australia. Under a plan now being worked

out, a helicopter will be sent to the shrimp fleet in Keppel Bay to pick up catches from the boats for immediate delivery to markets. The helicopter was expected to begin operations when shrimp fishing began in the Keppel Bay area in April or May. Hovering over trawlers, the helicopter will haul the baskets of shrimp up from the boats on a winch-powered cable and hook. The helicopter would also take supplies out to the shrimp boats to enable them to stay at sea longer.



Belgium

CONSUMPTION OF FISHERY PRODUCTS, 1958:

During 1958 the consumption of fishery products in Belgium amounted to 117,099 metric tons (about 258 million

Table 1 - Belgium's Consumption of Fishery Products, 1958							
	Fresh	Processed	Canned	Total			
Consumption of		(Metri	c Tons).				
Market Fish:	1						
Herring 1.	9,246	12,289	-	21,535			
Sprat17	1,756	-	-	1,756			
Mackerel 1.	1, 341	168		1,509			
Pilchards 1/ .	65		2,646	2,711			
Sardines 1/	-	-	3,648	3,648			
Salmon1/	1/	-	3,601	3,601			
	$\frac{1}{46}$,577	641	4,994	52,212			
Total fish · ·	58,985	13,098	14,889	86,972			
Consumption of							
Shellfish:2/				0.457			
Shrimp	3, 157	-	-	3, 157			
Lobster &	400		1 626	0 100			
Crawfish	493	_	1,636	2, 129			
Mussels	21,761	-	-	21,761			
Oysters	1,440	-	-	1,440			
Other shellfish			1 626	1,640			
Total shellfish 28, 491 - 1,636 30, 127							
1/ Bulk used for canning.							
2/ Nearly all consumed fresh.							

pounds). The total included 86,972 tons of marine finfish and 30,127 tons of shellfish (United States Consulate in Antwerp, report dated May 13, 1959.)

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IMPORTED CANNED

TUNA PRICES, MAY 1959: Imported canned tuna prices c.i.f.

Antwerp, Belgium, early in May 1959 were as follows: all solid pack in oil, 48 cans/cs. Japan: lightmeat, 7-oz. US\$7.00 and $3\frac{1}{2}$ oz. \$3.80; whitemeat, 7-oz. \$8.00 and $3\frac{1}{2}$ oz. \$4.25; and Peru: lightmeat, 7-oz. \$6.30 and $3\frac{1}{2}$ oz. \$3.80. About all the tuna imported into Belgium comes from Japan

Belgium (Contd.):

and Peru, the United States Consul in Antwerp reported on May 13, 1959.



Brazil

NEW FISH PROCESSING PLANT:

A new fish processing plant was scheduled to begin operations in June near the town of Maracana which is located on the Brazilian coast about 60 miles northeast of Belem and near the mouth of the Amazon River. The new plant expects to process fish and shellfish caught in the Amazon River and its tributaries and from the Atlantic Ocean. This fish plant will be the first of its kind to operate in that area. Processing operations will include the freezing of fish and shellfish, the drying of "pirarucu" for sale in Belem and the Braganca railroad region, canned fish for export, and possibly the importation of cod for further processing.

British Honduras

FISHERY PRODUCTS EXPORTS HIGHER IN 1958:

Exports of fishery products from British Honduras were higher in 1958. Exports of fish remained steady, but spiny lobster exports increased from US\$178,000 in 1957 to more than \$225,000 in 1958. Exports in 1955 were valued at only \$90,000. Reasons for the increase were due to a better "run" and less "anarchy" in the local industry, resulting in a more intensive effort.

There is now only one purchaser for packing and export. The Government apparently believes there is room for one more concessionaire although the reasons for this belief appear to be based on the desire for competition and the fact that the 1958 catch was relatively good. Nearly all of the entire catch of spiny lobsters is shipped by air to the United States. Fishing methods remain primitive although the one concessionaire (an American-owned company) has some modern

equipment. Most of the catch is made by small privately-owned fishing sailboats.



Canada

DOGFISH ERADICATION PROGRAM DISAPPOINTING:

Canada's west coast dogfish eradication and subsidy program, which ended March 31 after three months of fishing, was "very disappointing," according to a fisheries department spokesman in Vancouver, B, C.

A total of 2,470 tons of the shark-like predators was taken in two separate operations on dogfish populations in the Gulf of Georgia. Biologists estimated that to keep the population under control, about 30,000 tons of dogfish should be killed every year.

British Columbia fishery interests, despite the failure of the three-months fishery, are asking the government to restablish the program. The groups want a \$250,000 fund to be set up again and the operation spread over a full calendar year. Reports of trawler skippers who took part in this winter's fishery indicate that doglish are not present in the Gulf during the winter months, and they say that a summer and fall fishery would be much more productive.

Only \$67,300 of the \$250,000 set aside for the program was used during the winter's fishery. The time limit set on the subsidy program was up on March 31, and on that date the remainder of the money went back into general funds. The killing program, using chartered trawlers, was split into two separate fishing periods. The first (from January 19 to February 15) was the most disappointing, with 5 boats taking less than 250 tons. The second part of the program (from March 9 to 31) was more successful, with only 3 boats taking about the same tonnage in the shorter period. Boats lost 5 days of fishing in this second phase because of seasonal bad weather in the Gulf, which saw gale force southeast winds blowing for unusually long periods.

The liver program continued uninterrupted from January 12 to March 31, and accounted for 353,000 pounds of livers landed at Vancouver and Steveston. All but 8,000 pounds of the total came from the Gulf of Georgia. The livers were produced entirely by independent trawlers and long-liners.

Cost of the dogfish on a tonnage basis was rather high. The government paid an average of \$27.40 a ton, including the cost of the charters and the subsidy of 10¢ a pound on livers. For the charter boats alone, the cost of catching dogfish was \$45 a ton.

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QUEBEC FISH INSPECTION NOW UNDER FEDERAL GOVERNMENT:

Responsibility for administering the Fish Inspection Act and the Meat and Canned Foods Act as it concerns fishery products in the Province of Quebec has been transferred by mutual agreement from the Government of Quebec to the Government of Canada, the Fisheries Minister announced in Ottawa on May 19. The transfer was effective as of April 1, 1959.

In 1923, by agreement between the two governments, the administration of Quebec's fishery resource became the

Canada (Contd.):

responsibility of the Province. Except for fish inspection, this arrangement continues with respect to the control of the commercial fisheries under the Fisheries Act.

The formation of the Quebec Area completes the establishment, to bring about uniform inspection on a national basis, of the Inspection and Consumer Service of the Federal Department of Fisheries.

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COMMERCIAL FISHING LICENSES ISSUED IN BRITISH COLUMBIA INCREASED IN 1958:

A record number of commercial fishing licenses was issued during 1958 to British Columbia fishermen. In 1958 14,266 licenses were issued as compared to 12,016 in 1957.

engaged in commercial fishing on a parttime basis.

Of the 14,266 licenses issued, it has been estimated that only about 7,700 represented fishermen who are wholely or primarily dependent on the fishing industry for a livelihood.



Typical of the vessels used in British Columbia fisheries are gill-netters--the most common type of vessel used to catch salmon on the west coast of Canada. Purse-seiners and traps are also used to catch salmon.

The increases have been attributed primarily to the fact that expectations for the 1958 fishing season were high and a large number of sport fishermen

In 1958, 3,673 persons took out licenses for the first time. Of this group, 1,623 were trollers, 1,313 were gillnetters, and 409 were assistants in salmon purse seiners.

Canada (Contd.):

ATOMIC POWER MAY CANCEL NEED FOR HYDROELECTRIC POWER FROM RIVERS WITH FISH RUNS:

Atomic power may eliminate any need to develop the hydroelectric potential of the Fraser River in British Columbia, declares the Canadian Fisheries Minister. Development of the hydroelectric potential of the Fraser "may be a passing thing," he said, "because economic atomic power might be possible soon. But the need for fish as a high-protein food is becoming greater annually." The Minister told the Canadian Commons Fisheries Committee late in April that any hydroelectric program on the Fraser which would wipe out its salmon industry for a temporary benefit would be very poor reasoning.

"This is a powerful argument in favor of steps to safeguard fish resources now and in the future," he said. These observations were made by the Minister during a study of a preliminary report on flood control and hydroelectric power in the Fraser River basin.

The Minister said the least objectional plan for flood control and power development proposed no construction of dams on the main stem of the Fraser.

"At present there is no economic or practical device which can be recommended to pass migrant young salmon safely downstream at high dams," the Minister noted about other plans.

He said the demand for power was growing at a phenomenal rate. But there are alternatives to development of the Fraser, including the Columbia and Peace River systems. A huge coal-burning thermal plant being built in the Vancouver area would also relieve pressure.

The most immediate problem, however, was flood control. This could be achieved by building dams on Fraser tributaries. Some power also would be produced and the \$34 million salmon fishery would not be threatened.

The director of conservation for the Fisheries-Department said, "we can have

flood control and fish." The best method is construction of dams in the upper reaches of the river.

* * * * *

MARKETING OF NEWFOUNDLAND SALTED GROUNDFISH:

On August 1, 1958, the Canadian Government decided that the exclusive right to export processed salted fish from Newfoundland, held by the Newfoundland Associated Fish Exporters Limited, would not be extended beyond July 31, 1959. By the Act of Union between Canada and Newfoundland, the exclusive license to export salted fish, which had been granted to that Organization by the Commission of Government, was continued for a period of five years in order to allow the orderly development of alternative marketing arrangements during this period of transition. At the expiration of the license arrangement in 1954, it was again agreed to continue the exclusive license for a further period of three years, with the qualification that interprovincial trade in salt bulk was freed from this restriction. Subsequently, two extensions of one marketing year each were granted, the final one on August 1, 1958. Thus, the salt fish industry of Newfoundland has had a ten-year period in which to adopt marketing methods in conformity with the practice of this trade in other Canadian Atlantic Provinces and Quebec.

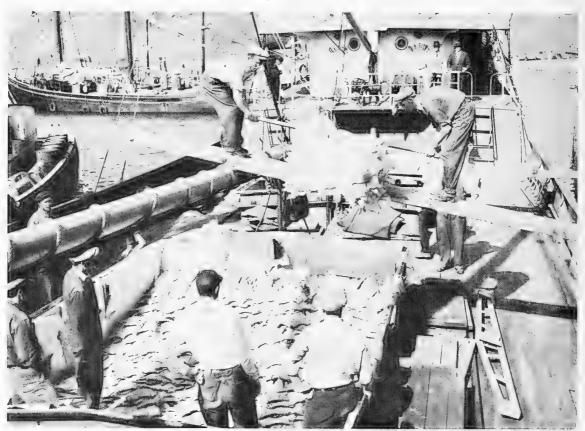
Serious consideration was given to alternative methods of marketing salt fish in Newfoundland. An Interdepartmental Committee made an extensive and exhaustive survey of the situation. Exporters, processors, fishermen, and government officials in the Atlantic Provinces and the Province of Quebec were interviewed and were given an opportunity to present their views.

After full consideration of all aspects of the trade, it was not found possible nor deemed in the best interests of the salt fish industry to adopt alternative methods of controlled marketing in the Province of Newfoundland. Accordingly, the export marketing of Atlantic Coast salted fish after July 31, 1959, will be carried out on the basis of free competition.

Canada (Contd.):

The Government will continue its present practice of supervising the inspection of Atlantic Coast salted fish by

the Department of Fisheries and will extend to exporters trade promotion assistance through the Department of Trade and Commerce in Canada and our Trade Commissioner Service abroad.



Freighter loading Newfoundland salted cod for delivery to Portugal.



Ceylon

JAPANESE AID SOUGHT IN 5-YEAR FISHERY PLAN:

Ceylon has requested Japan's full cooperation in a \$70 million five-year fishery program scheduled to start in October 1959. The gigantic project envisages construction of harbors, fishing fleets, and refrigeration plants.

The fishery program was based on a report submitted last fall to the Ceylonese Government on findings of a Japanese survey mission.

Despite a huge demand for fish in Ceylon, output is only 30 percent of the demand and some \$100 million worth is imported yearly. Under the five-year project, the amount imported is to be replaced by domestic fisheries.

Although it is not yet known to what extent the Japanese Government will cooperate, observers point out that it would be difficult for Japan to participate in the harbor construction project since this would call for an Export-Import Bank loan.

Ceylon (Contd.):

Opinion favoring the acceptance of the Ceylonese proposal is said being advanced such as Thailand, which is also seeking

The Government, however, is giving careful consideration to the project in view of relations with other countries, such as Thailand, which is also seeking



Beach seine fishing in Mullativu, Ceylon.

within the Government since the country is one of Japan's major markets (last year's exports totaled \$36 million and imports \$5.7 million).

Japan's help in the construction of fishing ports. (The Japan Times, April 14, 1959.)

Cuba

CLOSED SEASON FOR BULLFROGS, SPONGES. AND CERTAIN FINFISH:

The National Fisheries Institute of Cuba revoked the closed season invoked on April 1, 1959, on the capture of bull-frogs. The termination order effective on April 30, 1959, was published in the Official Gazette of April 28, 1959. The reasons given for the revocation was that the bullfrog spawning season was al-

ready over, plus economic and social demands on the part of fishermen and packers whose main source of income is the export of frog legs to the United States.

Another resolution, published in the Official Gazette of April 29, 1959, imposed a closed season on the capture of sponges effective May 5, 1959, in the northern maritime zone of Caibarien and the southern maritime zone of

Cuba (Contd.):

Batabano. Sponge fishing is still permitted off the north coast of Vuelta Abajo in the province of Pinar del Rio. The closed season will remain in effect until cancelled by a subsequent resolution.

The same resolution also imposed closed seasons, effective May 5, 1959, on the following fish species, to remain in effect until cancelled by subsequent resolutions: Biajaiba (Lane Snapper), Corvinas (Croakers), and Robalos (Snooks) -- United States Embassy, Havana, dispatch dated May 18, 1959.



Denmark

FISH MEAL PRODUCTION, IMPORTS AND EXPORTS, 1958:

Production of fish meal in Denmark increased about 14 percent; or from 58,000 metric tons in 1957 to 66,000 tons in 1958. The total available supply (production, imports, and stocks on hand) increased from 69,000 tons in 1957 to about 80,000 tons in 1958, due to increases of 8,000 tons in production and 4,000 tons in imports. The increasd production in 1958 was due to better landings of herring and sand eel or launce. Consumption of meal in Denmark was 22,000 tons in 1958 and 24,000 tons in 1957.

In 1958 a total of 53,000 tons were exported as compared with 42,000 tons in 1957. Denmark's best customers for fish meal were the United Kingdom with 23,000 tons or 44.1 percent and Holland with 16,000 tons or 31.7 percent. The United States purchased 991 tons, and the balance of the exports of about 53,000 tons was exported to 10 other countries.

Table 1 - Danish Exports and Imports of Fish Meal, 1958							
Destination	Herring Meal	Other Fish Meal	Total				
Exports:	(Metric Tons)						
United Kingdom	22,739	585	23, 324				
Holland	16, 114	639	16,753				
West Germany	2,799	2,470	5,269				
Italy	2,446	10	2,456				
United States	991	-	991				
France	907	-	907				
Czechoslovakia	475	-	475				
Belgium-Luxemburg	396	-	396				
Finland	341		341				
Mexico	280	-	280				
Philippines	207	-	207				
Switzerland	95	1/	95				
Sweden	81	398	479				
East Germany	-	894	894				
Other countries	-	15	15				
Totals	47,877	5,011	52,882				
Origin							
Imports:							
Iceland	90	6,926	7,016				
Norway		3,832	3,832				
Totals	90	10,758	10,848				
1/ Less than 1 metric ton.							

Imports of fish meal by Denmark totaled 11,000 tons--all from Iceland and Nor-

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MARINE OIL EXPORTS,

IMPORTS, AND SUPPLIES, 1958:
During 1958 the available Danish supplies of marine oils (fish-liver oil, fish oil, and marine-mammal oils), totaled 40,099 metric tons or 2,000 tons more than in 1957. This relatively minor increase was due to a larger domestic production as well as to increased imports of herring oil from West Germany, which more than offset a reduction of the whale oil imports. The larger domestic production of fish oil was due to increased landings of herring and launce or sand eel. The reduced imports of whale oil are explained by smaller requirements

of the margarine industry, the output of which was reduced in 1958.

The requirements of marine oils for both domestic and export purposes increased roughly by 4,000 tons. Consequently, the inventories of marine oils were reduced throughout 1958 as the supplies only increased 2,000 tons. Whale oil was the principal stock that was reduced. This seems a logical development as it is expected that the margarine industry will use smaller quantities than formerly. In other words, reduction of inventories may be considered a process of adjustment to lower requirements.

Denmark (Contd.):

The increased exports of 2,000 tons of marine oils were made up of primarily herring oil. The major share of the in-

creased exports was shipped to Sweden and West Germany. (Foreign Agriculture Service of the U. S. Department of Agriculture report from Copenhagen dated April 17, 1959.)

Table 1 - Danish Supply and Distribution of Marine Oils, 1957-1958								
	SUPPLY			DISTRIBUTION				
Туре	Opening Stocks Jan. 1	Produc- tion	Imports	Total Supply	Exports	Consump- tion	Ending Stocks Dec. 31	Total Distribu- tion
1958				(Metric				
Fish-liver oil	n.a.	200	1,416	1,616	119	1,497	n.a.	1,616
Fish (incl. herring) oil	2,298	16,980	5,235	24,513	11, 349	9,383	3,781	24,513
Whale and seal blubber oil	n.a.	1,000	16	1,016	-	1,016	n.a.	1,016
Whale oil	7,747	n.a.	5,099	12,846	102	9,073	3,671	12,846
Seal oil	n,a.	106	2	108	98	10	n.a.	108
Total	10,045	18,286	11,768	40,099	11,668	20,979	7,452	40,099
1957								
Fish-liver oil	n.a.	200	1,736	1,936	316	1,620	n.a.	1,936
Fish (incl. herring) oil	706	13,957	2,603	17,266	8,593	6,375	2,298	17,266
Whale and seal blubber oil	n.a.	1,000	_	1,000	-	1,000	n.a.	1,000
Whale oil	7,606	n.a.	10,263	17,869	105	10,017	7,747	17,869
Seal oil	n.a.	_ n.a.	20	20	14	6	n.a.	20
Total	8,312	15, 157	14,622	38,091	9,028	19,018	10,045	38,091
n.a.= not available.								

Table 2 - Denmark's Imports of Marine Oils by Country of Origin, 1958							
Country		Oil	Other	Total			
7	Fish-liver	Herring	Whale	Outer	Total		
	(Metric Tons)						
West Germany	296	3,951] 3	1 ., -	4,250		
Norway	853	385	5,096	1/18	6,352		
Iceland	220	1	_	-	221		
Sweden	1	478	-	_	479		
Jnited Kingdom	45	_	-	-	45		
Angola	-	370	-	-	370		
Other	1	50		_	51		
Total	1,416	5, 235	5,099	18	11,768		
1/ Whale and seal blubber (16 tons) and seal oil (2 tons).							

Table 3 - Denmark's Exports of Marine Oils by Country of Destination, 1958					
C	Oil				m
Country	Fish-liver	Herring	Whale	Seal	Total
	(Metric Tons)				
West Germany	57	2,063	31	56	2,207
Norway	_	1,513	- '	2	1,515
Sweden	28	7,082	_	22	7,132
Italy	5	9	28	18	60
Belgium-Luxemburg	5	26	_	-	31
Spain	4	163	-	_	167
Czechoslovakia	_	251	-	-	251
Hungary	15	222	43	-	280
Other	5	-	_	-	25
Total	119	11,349	102	98	11,668

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REVIEW OF FAROE ISLANDS FISHERIES, 1958:

Salted fish production in 1958 amounted to 29,850 metric tons or 450 tons above 1957. Landings from off the coast of Iceland of 7,800 tons were lower than in 1957, but the landings from the fisheries off Greenland were a record 19,250 tons in 1958 (12,800 tons in 1957). Local fishing around the Faroe Islands yielded 1,550 tons of salted cod as compared with

2,800 tons the preceding year. The drop was due to an increase in the sale of 11,000 tons of fresh iced-fish to the British--about double the 1957 figure. Herring landings in 1958 of 136,000 barrels were about the same as for 1957. The whaling industry had a poor year in 1958 with only 57 whales captured as compared with 199 the preceding year.

Exports of all products from the Faroes in 1958 totaled 91.7 million kroner Denmark (Contd.):

(US\$13.3 million), about the same as in 1957. Exports of salted fish accounted for 21.3 million kroner (US\$3.1 million) as compared with 15.6 million kroner (US\$2.3 million) the year before while dried fish exports of 33.2 million kroner (US\$4.8 million) in 1958 were down about 5.3 million kroner (US\$767,000) from 1957. As of January 1, 1958, inventories of exportable products amounted to 12.5 million kroner (US\$1.8 million).

Exporters of salted fish in 1958 were beset by difficulties in selling dried fish to Spain and Brazil. Payments on exports to Spain were slow and conditions in the Brazilian market were unsettled. The difficulties experienced in selling dried cod brought about increased sales of salted fish. This development resulted in less call for loans by the fishing industry since export of salted fish results in quicker payment to the processors of the fish.

The Faroe Islands fishing fleet was increased by one vessel in 1958.

The Bank of the Faroes loaned 22.8 million kroner (US\$3.3 million) to the fishing and fish processing industry in 1958, according to the annual report of the Foroya Bank in Thorshavn, the largest bank in the Faroe Islands. (United States Embassy, Copenhagen, report dated March 25.)



El Salvador

SHRIMP FISHERY TRENDS:
On February 7, 1959, the largest fishing company in El Salvador inaugurated a shrimp freezing plant and a pier for its 6 boats at its Pacific Coast base of operations at Puerto El Triunfo, on the Bay of Jiquilisco. Prior to construction of this pier, fishing boats operating from this "port" have had to be loaded and unloaded across extensive mud flats. The freezing installation, which uses power brought in over a new transmission line, has a freezer with a rated hourly capacity of some 3,500 pounds and a cold-

storage room for some 180,000 pounds of shrimp. The frozen shrimp is trucked to San Salvador, from where the largest proportion is then flown to the United States.

At the inaugural ceremonies at Puerto El Triunfo, a company spokesman emphasized the contribution that this relatively new industry is making to the economy and made a strong plea for more Government support (issuance of licenses to operate additional fishing boats). The firm is presently capitalized at US\$400,000, of which half is Salvadoran, about 45 percent that of the Portuguese fishermen who brought in the boats, and the balance Panamanian.

The 1958 landings by Salvadoran fishermen amounted to 1,116,879 pounds of fish, 846,051 pounds of shrimp, and 92,191 pounds of small shrimp (camaroncillo), according to preliminary Government statistics. The shrimp landings are believed to be a mixture of heads-on and heads-off weight, but principally heads-off.

German Democratic Republic

CANNED TUNA PRICES, MAY 1, 1959:

Importers and other trade sources in West Germany report that most of the canned tuna imported is of Japanese and Peruvian origin. According to trade sources in the Hamburg area imported canned tuna prices (c.i.f. Hamburg) as of May 1, 1959, were: Japan; all solid pack, 48 cans per case: light meat (skipjack and yellowfin) in cottonseed oil, 7oz, cans US\$6.50-6.80, $3\frac{1}{2}$ -oz. cans \$3.65-3.85; light meat (bluefin and big-eyed) in cottonseed oil fancy B, 7-oz. cans \$6.35, $3\frac{1}{2}$ -oz. cans \$3.50; light meat (skipjack and yellowfin) in aspic, 7-oz. cans \$6.40 a case; flakes, 7-oz. cans \$6.40-6.45; Peru: light meatin cottonseed oil, solid pack, 48 cans/cs., 7-oz., top brand, \$6.75; other brands, \$6.20-6.35; $3\frac{1}{2}\text{-oz.}$ 96 cans/cs., \$6.45.

Prices c.i.f. Hamburg for the top Peruvian brand (fancy white solid pack in cottonseed oil for a case of 48 7-oz. cans) rose from \$5.45 as of April 15 to \$6.75

German Federal Republic (Contd.):

on or about May 1. Light meat solid pack in cottonseed oil as of May 1 was 6.20-6.35 for 7-oz. cans (48 to the case) and 6.45 for $3\frac{1}{2}$ -oz. cans (96 to the case). The Hamburg importers expect some decrease in c.i.f. canned tuna prices from the pack of the 1959 season.



Iceland

GROUNDFISH LANDINGS IMPROVE IN APRIL:

The groundfish catches in April 1959 by Icelandic inshore vessels improved so much that it now appears likely that, despite the poor catches in February and March, the total catch of the main winter season will exceed last year's record. Ordinarily, catches fall off in late April, although the season does not officially end until May 10. However, catches continued good this April and freezing plants were working overtime.

The best quality cod is caught earlier in the season, by the line boats, but the bad weather limited the catches of fish at that time. A higher proportion of the present catch is being rejected by the freezing plants as unfit for filleting—though suitable for stockfish. It is by no means certain, therefore, that the export value of the catch will be as high as in 1958, according to an April 24, 1959, dispatch from the United States Embassy in Reykjavik.

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CONTRACTS FOR THREE LARGE TRAWLERS FROM WEST GERMANY:

The Icelandic press has announced that contracts have been signed by private owners for the construction of three large trawlers by a West Germany shipyard to be financed by a ten-year West German bank credit. Two of the 950-ton ships will be purchased by a herring and fish meal factory at Akranes, and the third by a fish producer of Akureyri. The contracts are subject to approval by the Icelandic Government, which must guarantee the loans. If the contracts are approved, the trawlers will be delivered January 31, 1961.

The bulk of the Icelandic large trawler fleet has returned to the Newfoundland fishing grounds, two months ahead of last year. It is primarily for this distant type of fishing that the larger trawlers are needed, according to an May 22, 1959, dispatch from the United States Embassy in Reykjavik.

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LARGE TRAWLER TO BE BUILT IN WEST GERMANY:

The town council of Hafnarfjordur, Iceland, has authorized the municipal trawler company to proceed with a contract to build a 900-1,000 ton supertrawler in Bremerhaven, West Germany. The new vessel will replace the trawler Juli, lost with all hands this past winter. The new trawler, when completed, will be the largest in Iceland and will have a capacity of 500 metric tons of iced fish, the United States Embassy in Reykjavik reported on April 24, 1959.

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INVESTMENT IN FISHING INDUSTRY HIGHER IN 1958:

Investments during 1958 in the Icelandic fishing industry are estimated to be up about 8 percent as compared with 1957, with an increase in the tonnage of the fishing fleet more than offsetting a decline in additions to processing plants. For the purposes of asset formation, investment in fishing vessels is calculated on the basis of construction performed during the year, whether in Iceland or abroad for the Icelandic account, and on this basis a rise of about two-thirds over and above the 1957 level was expected. During 1958 the following vessels actually were added to the fishing fleet: 2 (replacement) trawlers, 1,491 tons total; 11 fishing boats, 1,439 tons total; and 3 (East German) trawlers, 747 tons total.

Investments in fish-processing plants in 1958 were estimated to be only two-thirds as much as in 1957, and the lowest level in four years. This was only natural, in view of the considerable idle capacity existing most of the year and especially in the smaller ports. This problem has focused public attention on the need to replenish the fleets of both the trawlers and motor boats. When

Iceland (Contd.):

ample fish supplies are delivered, freezing plants are relatively more profitable investments than boats or trawlers. But this is not so when raw material is lacking (as it has been for most plants outside the Faxa Bay and Westman Islands areas). Having succeeded in getting state loans for local freezing plants or herring factories, many of these smaller ports have now turned to the Government for help in obtaining the fishing vessels necessary to assure raw material to keep the plants operating.

The major effort to meet this problem has been the scheme to purchase 12 new East German 250-ton fishing vessels, capable of trawling in home waters. Three of these were delivered before the end of 1958, with the rest expected to arrive in 1959. All are destined for smaller ports outside the more populous southwest area of the country. (United States Consulate dispatch of April 30, 1959, from Reykjavik.)

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FISHING LIMITS DISPUTE WITH BRITISH FLARES UP AGAIN:

The refusal of the British to recognize Iceland's extension of fishing limits from 4 to 12 miles from the coastline has been the cause of friction between the two governments for some time. Two incidents concerning British trawlers (Carella and Swanella) allegedly fishing inside Iceland's four-mile fishing limit have brought the dispute in the headlines again because the British have refused to accept the Icelandic Coast Guard reckonings.

On April 18, the Iceland Ministry of Foreign Affairs released the substance of a note delivered to the Foreign Minister by the British in reply to the Icelandic note of protest of March 26, in connection with the Carella incident. The note said that: (1) the British Government does not recognize Iceland's fishing limits outside the three-mile territorial waters limit and therefore repudiates the right of Icelandic Coast Guard cutters to seize foreign vessels "on the high seas;" (2) the British trawler Carella was not within the four-mile de-

marcation as computed by the Icelandic Coast Guard cutter; (3) the British Government considers the regulations on a 12-mile fisheries jurisdiction to be invalid according to international law; and (4) pending the outcome of the prospective International Conference on the Law of the Sea in 1960, a temporary agreement on fisheries be reached either by negotiations or by referring the matter to the International Court.

An editorial in an Icelandic newspaper stated that the purpose of British "provocative action" is to lay the groundwork for world-wide support for some kind of Faroese-solution (six-mile fishery limit) issue at the next Law of the Sea Conference in 1960.

The Icelandic Coast Guard reports that 29 British trawlers were sighted fishing within the 12-mile fishery limit on April 21 in three areas protected by British warships. The areas are off Adalvik, the Eldey Bank, and the Selvog Bank. (United States Embassy report from Reykjavik, April 22, 1959.)



Iran

SHRIMP FISHERY IN THE PERSIAN GULF EXPANDING:

In order to help develop the Iranian shrimp industry in the Persian Gulf, a small fleet of trawlers is being shipped to Iran. Four of the 60-foot trawlers passed through the port of New York City in mid-April on the deck of the freighter Neidenfesls. The trawlers were loaded at Cristobal, Panama, and are scheduled to land at Khorramshahr, Iran.

In addition, the 1,000-ton mothership Moyon I is due at Khorramshahr around mid-May. Later an additional three trawlers will arrive, which will make a total of seven trawlers.

The shrimp fleet was outfitted by a New York City importing company. The trawlers will be manned by Americans and some Europeans who will teach the Iranians how to operate them and fish for shrimp. The President of the New Iran (Contd.):

York importing firm points out that Iran at present has only one trawler and one mothership in operation. Shrimp shipments to the United States from that operation average about 100,000 pounds a month. With the addition of the seven

trawlers and the second mothership monthly shipments to the United States are expected to reach one million pounds a month. The New York importing firm is the selling agent in the United States for the Iranian fishing company which has the fishing rights in Iranian waters.

Israel

TUNA FISHING COMPANY WITH JAPANESE SWISS PARTICIPATION IN OPERATION:

The Shimu Maru, the vessel fishing for the Joint Israeli-Japanese-Swiss Fishing company, started operations in November 1958 and mid-April had landed two trips of tuna--600 metric tons of fish. It was expected that by mid-May a third trip of 280 tons would be landed.

The Japanese Company operating the vessel with a complement of Israeli

fishermen sells the fish to the company in Israel at \$255 a metric ton, but since there is an Israeli commodity price adjustment tax of \$380 a ton levied on frozen tuna, the actual price of the tuna is \$644 a ton delivered.

The sale of the tuna is handled by the company established in Israel. Collective farms and armed forces are the principal buyers, but a part of the fish is sold in the local markets. In spite of the high price, reports indicate that there is a demand for the frozen tuna landed by the Shimu Maru.

Italy

ELECTRONIC DEVICE TO MEASURE STRAIN ON OTTER TRAWLS DEVELOPED:

A new electronic device which fits easily on a conventional trawl winch, and which not only saves the net from being torn or lost, but tells how much fish is in the net, is in the process of being patented by an Italian inventor. The device is the successor to an earlier invention which measured only how many fish were in the net. The inventor states that his new device is a very simple arrangement of great value to the trawling fleets of the world. It will be especially useful to deep-sea trawlers, and boats dragging in rough waters.

The device consists mainly of two hinged collars attached to the terminals of the winch. Two dynamometers fitted with electroacoustical devices are coupled to the collars, and anchored to the deck.

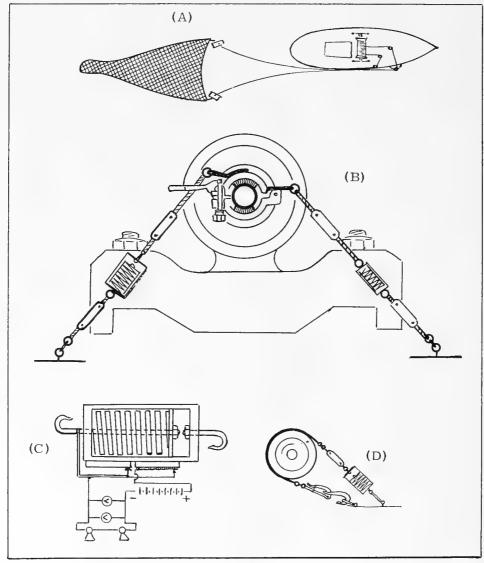
Main purpose of the invention is to avoid destroying the net on rough bottom, or on obstacles unseen on sounding equipment. It will also, by measuring the strain on the towing lines, give a measure of how much fish is in the net.

A warning signal, working through a voltmeter, is placed on the bridge and in the engineroom, giving a permanent and instantaneous reading of the strains developed by the trawl. A horn is sounded and a red light flashes immediately when the net becomes fouled on the bottom or on an obstacle.

The device is so set up on the winch that it automatically disengages when the strain reaches the danger level. When this brake is released the winch is then running free, letting out line until the net is free, or until the ship is stopped or diverted.

A San Francisco company is negotiating with the inventor for manufacturing rights, and it is expected the new device will be on the market within a year. Patents are pending in the United States, Canada, Italy, and Norway, and manufacturing rights throughout the world have been reserved for a year.

Italy (Contd.):



- (A) Electrical warning and correctional device fits on side of trawl winch; warns skipper and engineer when strain on towing line reaches danger point. Device also gives accurate indication of weight of fish in net.
- (B) Fitting device to side of trawl winch, collar is fastened to axle of winch, but can be unhinged for normal operation. Lining, similar to auto brake lining, is fitted tightly around axle. Variation of strains coming from towing lines is transmitted through the winch axle to the bearings in the collar, and then to the spring of the dynamometer. Voltmeters then register strain.
- (C) Hook on ends of dynamometer are hooked to special attachment running from winch to deck--see (B). Any change in strain on towing lines around the winch is registered by the two voltmeters--see (D).
- (D) Device can also be fitted to winches of limited capacity as shown.



Japan

TUNA EXPORT QUOTAS FOR 1959 SET BY PRODUCERS' ASSOCIATIONS:

In preparation for the beginning of a new export year on April 1, 1959, Japanese tuna industry associations held a series of meetings to set export production quotas and check prices, and to decide the terms of allotment of the quotas among their members.

The Export Tuna Canners' Association has decided on a total production quota of canned tuna in brine for export to the United States of 2,450,000 cases, with a possible increase of another 10,000 cases. This increase of about 25 percent over the 1958 export quota of 2 million cases reflects the rise in the United States canned tuna pack and consumption.

The Export Tuna Freezers' Association has set its production quotas for United States exports and the division of production between vessel-frozen and

shore-frozen fish. The quota for albacore is 29,700 tons, of which 2,910 tons can be frozen aboard fishing vessels and 1,590 tons aboard motherships. Exports of tuna loins will be limited to 2,970 tons, at minimum prices of \$730 for albacore and \$565 for yellowfin. Export production of frozen yellowfin has been divided on the basis of 35,000 tons for freezers in Japan shipping by freighter and 120 landings for fishing vessels delivering fish directly in foreign ports (Atlantic fishery). The vessels will be under the further limitation that no vessels may make more than two such landings for export to the United States within one year. It has been estimated that 120 clipper landings will represent between 35,000 and 40,000 tons of tuna. Check prices per short ton for frozen yellowfin have been set at \$190 for large, \$210 for medium, and \$220 for small fish.

The Freezers' Association has decided to set its 1959 broadbill swordfish production quota at 4,455 tons, down slightly from last year's 5,000 tons because of slow sales.



Frozen tuna at Tokyo Wholesale Fish Market. The fish have been landed from the 300-ton tuna long-liner at the dock. Tuna were caught in the Indian Ocean.

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Japan (Contd.):

TUNA MOTHERSHIP OPERATIONS AND RESEARCH:

Licensing policies for Japanese tuna mothership operations for 1959 were announced on April 8, 1959, by the Fishery Agency. The basic production limit for the tuna mothership fishery in 1959 will be 13,600 metric tons, but this limit may be exceeded by as much as 9,300 tons if some of the participating fishing companies agree to lay up their vessels for corresponding periods during the rest of the year. Since the operating plans of the principal companies engaged in this fishery, as reported by the trade press, already exceed this limit, the Fishery Agency is faced with the task of apportioning the production quota among license applicants in accordance with their past production records.

On April 4, the Fishery Agency issued a significant directive aimed at strengthening and coordinating the activities of the research vessels, fisheries guidance vessels, and training ships which various local governments are using to fish for tuna. Noting that the number of such vessels has increased rapidly in recent years, and now totals more than 40, the directive states that, if they are used primarily to earn income, there is a danger that they will have the effect of economically oppressing commercial tuna fishermen. The directive prescribes a very broad program of standard observations, including keeping of fishing records, collection of biological specimens, tagging, morphometric measurements, scale and blood samples, and larval fish collection. The data and specimens will be kept and processed by the Nankai Regional Fisheries Research Laboratory. The result should be a great strengthening of tuna research in Japan. (United States Embassy, Tokyo, April 1, 1959.)

ALBACORE TUNA FISHING SLOW IN DEVELOPING:

According to an early April report issued by the Fisheries Research Team of Takai University, the water temperature around the usual albacore fishing ground stretching southeasterly from Japan's mid-Honshu had dropped slightly from the last 10-day period.

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Hidden in the main cold water mass are thick groups of small as well as medium- and large-sized albacore and on March 26 a school of 24-pound albacore mixed with yellowfin and skipjack was seen to rise to the surface. Act of rising up near the surface is done usually at daybreak and just before sunset. The general pattern of water mass formation looks quite similar to last year.

As for an immediate outlook, waters within 30°-31° N., 133°-135° E., in the offing of Shikoku have a greater probability of containing small- and mediumsized fish schools rising up to the surface. Catches after the first 10-day period of April should exceed the actual result achieved last year, according to the prediction.

* * * * *

PRICE CUT ON CANNED WHITE MEAT TUNA IN BRINE:

Provisionally the Japanese Tuna Packers' Association Directors on April 15, 1959, decided to recognize a \$1.00 per case cut in the price of white meat tuna canned in brine sold to the United States for the next, or 5th, "sale period" only. Prices for lightmeat tuna remained unchanged.

For the 4th "sale period," total exports of 350,000 cases are expected by the packers, of which albacore would be 250,000 cases. Packers are reported paying about \$300 a short ton ex-vessel for albacore tuna. However, if albacore landings continue light, the cut in price will probably be reconsidered.

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REDUCED PRICE STIMULATES SALES OF TUNA LOINS:

According to a Japanese newspaper report on March 5, 1959, the reduced check prices of US\$730 (formerly\$850) a ton for albacore loins and \$565 (formerly\$620-640) for yellowfin tuna loins have resulted in increased sales to the United States. The former check prices for tuna loins were fixed when market conditions were favorable, but under the weaker market of the past few months those prices were too high and sales lagged.

Japan (Contd.):

Due to the slow market for tuna loins since the first of the year, trade sources predicted that it would be difficult to dispose of the entire 3,000-metric-ton quota before the end of the fiscal year ending March 31, 1959.

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EXPLORATORY TUNA FISHING VESSEL REPORTS GOOD CATCHES OFF GALAPAGOS ISLANDS:

The Japanese pelagic fisheries guidance vessel Iwaki Maru from Fukushima Prefecture was due back in Misaki the latter part of March from its trip to the eastern Pacific. The vessel left Japan for its third trip during December 1958.

The vessel reported that upon arriving at the fishing grounds off the Galapagos Islands (123° 18' W. long. and 6° 25' S. lat.) the first long-line set yielded 28 yellowfin and 5 big-eyed tuna, 47 large bonito, 20 broadbill swordfish, and 4 striped and black marlins--total weight 5.3 metric tons. Following the first set, catches averaged 5.6-6.5 tons or about twice what was obtained during the vessel's second trip. It was expected that the vessel would have a full load of 236 tons by early March and be on its way back to its home port two or three weeks ahead of schedule.

* * * * *

NORTHWEST PACIFIC SALMON FISHERY QUOTA FOR 1959:

A quota of 85,000 metric tons of salmon has been set by the International Northwest Pacific Fisheries Commission for the 1959 Japanese mothership salmon fishery. The quota is 23 percent below the quota of 110,000 tons in effect for the 1958 season and about 29 percent under the quota of 120,000 tons in effect for 1957. The quota agreement was reached on May 13, 1959, after nearly four months of negotiations between the Japanese and Russian delegates to the Commission. The original request by the Japanese at the start of the negotiations was for a 165,000-ton limit with the Russians countering with an offer of a 50,000-ton limit.

Acceptance of the reduced quota by the Japanese is going to mean a heavy blow to those directly and indirectly concerned with the Japanese Northwest Pacific highseas salmon fishery, according to a spokesman for the Japanese Federation of Salmon Fishing Cooperatives.

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PLAN TO CAN PET FOOD FROM FISH WASTE:

Japanese high-seas salmon packers are planning to pack pet food from waste salmon at their land processing establishments this season. Reports indicate that there is an increasing demand from the United States for Japanese canned pet food. Also, a number of Hokkaidofish canners have now begun to plan packing of pet food from such fish as saury, herring, Atka mackerel, etc., as may be caught locally. It is even said that some sample lots have already been canned by a few canners who hope to get into mass production in the future. The major fishery items canned in Hokkaido are pink salmon, king crab, Kegani crab, Hanasaki crab, saury, squid, scallop, clam, and whale meat.

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WHALE MEAT SOLD TO UNITED STATES FOR PET FOOD:

A contract sale of 1,000 metric tons of Antarctic whale meat for use in canned pet food was announced in mid-April by a Japanese company. The price of the sale was \$240 a ton c.i.f. New York City. Another Japanese company is reported negotiating a similar sale.

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FISH SAUSAGE DEMAND REFLECTS CHANGING FOOD HABITS:

Changing food preferences are bringing a boom to the Japanese manufacture of fish sausage and similar products. Figures released by the Japan Fish Sausage Manufacturers' Association indicate that production of conventional types of fish sausage and "ham" was up to 49,190 metric tons in 1958, as compared with 38,217 metric tons in 1957, and a further increase of at least 20 percent is being predicted for 1959. Since the fall

Japan (Contd.):

of 1958, the manufacturers have been busy introducing new products, such as "salami," "sliced ham," and "corned beef," and although production statistics seem to be lacking for those exotic items, they are also expected to develop greatly during 1959.

Competition is keen among the manufacturers of the new foods, principally the three or four largest marine products companies in Japan, and the effect of the fish sausage boom is also seen on competing food products. Last year, fish sausage and ham production nearly equaled that of meat sausage and ham, and it will probably surpass the latter in 1959. The popularity of these handy, relatively imperishable foods is also said to be holding back expansion of demand for fresh fish.

A comparison between Japanese consumption of marine products during 1948 and 1958 reflects the change in demand. Taking 1948 consumption as 100, the 1958 indices for the following foods are: fresh fish 112, salted and dried fish 153, refrigerated products 268, and whale meat 460 (United States Embassy in Tokyo, May 1, 1959.)

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CANNED SARDINE PRICE TO WEST AFRICA CUT:

A cut of 28 cents a case was recently made by the Japan Canned Fish and Shellfish Sales Company for sales to West Africa of small No. 1 type canned sardines. West Africa, before 1958, purchased about 150,000 cases of Japanese canned sardines, but recently South African sardines have cut into the sales of Japanese sardines to that area. In 1958, exports of canned sardines from Japan to West Africa were only about 50,000 cases. Therefore, in an attempt to bolster sales to that area, the Japanese announced the cut in price.

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CANNED SAURY PACK TARGET REDUCED:

As much as 640,000 cases of canned saury were in stock as of the first part

of April and only 340,000 cases were expected to be moved by the end of August, according to a report of a meeting of the Japan Export Canned Saury Manufacturers Association on April 13, 1959. At first the Association was planning on a pack target of about 650,000 cases, but because of the unsold stocks on hand it is planned to reduce the target to 600,000 cases for the new pack season.



Kore a

INCREASE IN EXPORTS OF FISHERY PRODUCTS PLANNED:

The Republic of Korea trade program for the second half of 1959 includes an estimated US\$4.6 million in exports of fishery products. The planned exports of fishery products include \$570,000 of frozen shrimp. Considerable interest in Korean shrimp supplies has developed in the United States and this item may become a substantial source of foreign exchange in the future.



Mexico

MERIDA SHRIMP FISHERY TRENDS, MARCH 1959:

The Mexican shrimp fishing industry in the Campeche and Ciudad del Carmen areas of the Gulf of Mexico has declined to the point of crisis due to small catches, lower prices on the world market, and increased costs of operation. The small catches are believed to be due in part to natural causes, but they may also be the result of past fishing practices, particularly the heavy catches of small immature shrimp.

Increased costs of petroleum, oil, and repairs have forced some boat owners, whose margin of profit is at best quite low, to tie up their vessels, thus leaving idle fishermen who must seek economic assistance from the cooperatives.

Representatives of the various sectors of the shrimp industry assembled to consider means of combating the problem and adopted a program which would ban catches of small shrimp and

Mexico (Contd.):

forbid their purchase by the cooperatives, declare white shrimp out of season for three months, and work toward a strict control of fishing throughout the Gulf of Mexico, the latter presumably contemplating action at the diplomatic level. (United States Consul dispatch of April 3, 1959, from Merida.)

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VOLUNTARY CLOSED SEASON FOR SHRIMP FISHING IN CAMPECHE AREA:

The fishermen's cooperatives and the shrimp industry of Ciudad del Carmen and Campeche, Mexico, have agreed on a two-months (April 1 to May 31) closed area which extends out into the Gulf of Mexico nine miles. The agreement, which was reached on March 31, includes penalties and the boat crews are required to sign a copy of the agreement. The agreement also bans the catch or purchase of shrimp smaller than 50 to the pound heads on. The penalties and rules are:

- 1. Three months suspension for the crews of ships caught fishing within nine miles of shore.
- 2. Permanent suspension in case of repetition.
- 3. For capture or transport of white shrimp (<u>Penaeus setiferus</u>), confiscation of the catch and the penalties mentioned above.
- 4. If a boat owner desires to force the crew to fish within nine miles, he must do so in writing. The same penalties will be applied to the ship and the owner will be obliged to maintain the crew during the penalty period.
- 5. Any company buying or found having white shrimp in possession will be penalized as follows: (a) confiscation of the shrimp; (b) expulsion from the National Chamber of the Fishery Industry; (c) request to the authorities to close the plant.
- 6. The cooperatives will not issue certificates for white shrimp during the closed period. (According to Mexican law legal transactions involving shrimp must be accompanied by a certificate from a fishing cooperative.)
- 7. The Chamber, the cooperatives, and the authorities will undertake the enforcement and any ship caught within nine miles will have the penalties applied automatically without recourse.
- The Chamber, cooperatives, and the authorities will, upon termination of the closed season, send ships to determine whether the closed season should be extended or not

The Ciudad del Carmen-Campeche area in the Gulf of Mexico has been suffering from low catches of shrimp since the fall of 1958. The closed season is an attempt to prevent the capture of small white shrimp and to increase catches later on. However, since practically the entire range of the adult white-shrimp population is involved in the closed area, the results of the closed season may not be those anticipated by the proponents of the measure. Depending upon the recruitment rate of small shrimp and growth and natural mortality rates the area could wind up inhabited by a smaller total poundage of shrimp at the end of the closed season than at the beginning.

In any event, the measure, if complied with, should eliminate shipments of white shrimp from this region to the United States for two months. Normally, on an annual basis, about one-third of the Ciudad del Carmen landings are white shrimp whereas the Campeche landings are composed of a small percentage of whites.

The Mexican shrimp industry not only in the Carmen-Campeche area but elsewhere in the Gulf of Mexico is in a

very distressed condition because of light catches. The industry is further plagued by rising costs of operation.

Shrimp landings for the first quarter of 1959 in the Campeche-Carmen area totaled 2.8 million pounds heads on as compared to 4.7 million pounds the same quarter in 1958.

Shrimp landings for the first quarter of 1959 in the Campeche-Carmen area totaled 2.8 million pounds heads on as compared to 4.7 million pounds the same quarter in 1958. (United States Embassy dispatch from Mexico dated April 3, 1959)



Morocco

FISHERY PRODUCTS LANDINGS AND FOREIGN TRADE:

Landings of fish and shellfish in Morocco (includes both Northern and Southern Zones) during 1957 were about 142,776 metric tons, a record for recent years. The 1957 landings were greater than in 1956 by about one-third. Landings were curtailed at the height of the season due to lack of buying interest on the part of the fish canners. The market for canned fish was depressed, but demand was good for fish meal. though the fish meal manufacturers could have utilized surplus sardine catches for fish meal, they were prevented from buying the surplus because the fishermen's labor union, would not allow the vessels to sell fish unwanted by the canners at the lower price offered for fish for reduction into fish

With a large stock of canned sardines unsold from 1957, the outlook was not bright for the canning industry in 1958.

Landings in 1957 included 109,828 tons of sardines, 9,373 tons of tuna, 22,734 tons of other finfish, and 841 tons of shellfish. The canning industry consumed 70,630 tons of sardines and 6,856 tons of other fish; the reduction plants used 31,276 tons; 21,776 tons were sold for human consumption; 6,684 tons were frozen for export; and the balance used for bait, salting, and unspecified purposes.

Morocco's production of processed fishery products amounted to 70,438 tons-canned sardines 27,089 tons, canned tuna 17,401 tons, other canned fish

Morocco (Contd.)

				/					
	Tabl	e 1 - Moro	cco's Exports ¹	of Fis	nery Products, 1	1957			
		West	French West		British African			Other	
Product	France	Germany	Africa	Italy	Territories	States	Algeria	Countries	Total
					(Metric Tons).				
Sardines:							1	l	
Canned	10,661	2,890	2,050	1,709	1,661	313	-	5,755	25,039
Fresh	4,979	-	13	61	-	-	60	3	5,116
Frozen		-	-	-	-	-	411	-	3,992
Salted	648		_	-	-		37	42	727
Total Sardines	19,869	2,890	2,063	1,770	1,661	313	508	5,800	34, 874
Tuna:	,								Ī
Canned	888	-	28	-	-	-	140	143	1, 199
Fresh	504	_	-	6			-	26	536
Total Tuna	1,392	-	28	6		-	140	169	1,735
Other fresh fish	333		5	144		-	2,712	611	3,805
Shellfish, frozen or fresh		-	-	299		-	129	4	613
Shellfish, canned		-	-	16	-	_	3	4	73
Other, dried and salted		9	-		-	-	38	24	165
Mackerel, canned	774	-	-	60			260	27	1, 121
Fish meal	2,944	2,712	-	285		3,482	-	3,278	12,701
Fish oil ² /	1,699	161	-	23	-	-	-	215	2,098
Other canned	-	-	-		-	-	-	14	14
Totals	27,336	5,772	2,096	2,603	1,661	3,795	3,790	10, 146	57, 199
1/ Southern zone only.									
2/ Includes cod-liver oil.									

663 tons, salted fish 1,597 tons, frozen fish about 5,000 tons, fish meal 12,764 tons, fish oil 2,927 tons, and fertilizer 2,997 tons.

Exports of fishery products from the southern zone of Morocco in 1957 totaled 57,199 tons. France was Morocco's best customer and accounted for 47.8 percent, or 27,336 tons, of the total exports. The United States purchased about 4,795 tons--3,482

tons of fish meal and 1,313 tons of sardines.

Imports of fishery products by Morocco in 1957 totaled 1,677 tons, and included 1,618 tons of fresh fish, 295 tons of salted fish, 354 tons of shellfish, and 10 tons of salmon and other products. The United States share of Morocco's imports of fishery products was only about 7 tons of canned salmon. (United States Embassy in Casablanca, November 10, 1958.)



Mozambique

PORTUGUESE-AMERICAN COMPANY TO FISH FOR SHRIMP AND SPINY LOBSTER:

A new fishing company formed with Portuguese and American capital (about US\$105,000), with headquarters in Lourenco Marques, Mozambique, was scheduled to start fishing for shrimp and spiny lobsters about July 1. Late in May the company was waiting for the delivery of two fishing vessels from the United States, and later on additional boats will be added to the fleet.

A contract has been signed by the new company with the Mozambique railroad administration for the use of a large part of the only refrigerated warehouse in Lourenco Marques. In the initial stages,

plans call for the sale of shrimp and lobsters to Mozambique and neighboring territories. Later, when space becomes available on reeferships, the firm expects to export shrimp and spiny lobsters to the United States.

All individuals or firms interested in entering commercial fishing ventures in Mozambique must be licensed by the Government. All licensed fishermenare required to report their catches to the Port Captain, who attempts to regulate the licensing of fishermen in order to avoid oversupplies in the markets.

Commercial fishery statistics on the landings of fish and shellfish in the fishing ports of Mozambique are difficult to obtain. During 1956, the latest year for which statistics are available, fish

Mozambique Contd.):

entering those ports amounted to 5.9 million pounds; shellfish, 0.6 million pounds; shrimp, 0.6 million pounds; and unclassified or other fishery products, 0.2 million pounds. The principal port was Lourenco Marques where about 57 percent of the total fish and shellfish was landed. (United States Consulate dispatch of May 20, 1959, from Lourenco Marques.)

cans/cs., \$4.27. Peru: bonito, light meat in cottonseed oil, solid pack, 7-oz., 48 cans/cs., \$6.30; $3\frac{1}{2}$ -oz., 48 cans/cs., \$3.92 a case.

Importers state that there is very little demand for canned tuna in Holland and that a large part of the purchases are re-exported. Consumers prefer the solid pack light meat canned tuna, a United States Embassy dispatch (May 12, 1959) from the Hague states.



Netherlands

UNITED STATES CANNED TUNA PRICED TOO HIGH TO MEET COMPETITION:

According to a Netherlands importer, Japan and Peru are practically the only suppliers of canned tuna to the Netherlands. Wholesale prices quoted c.i.f. Rotterdam late in April for Japanese and Peruvian canned tuna were: Japan: white meat, solid pack in oil, 7-oz. cans, 48 cans/cs., US\$7.00-7.50 and in $3\frac{1}{2}$ -oz. cans, 48 cans/cs., \$4.00-4.50; light meat in oil, solid pack, 7-oz. cans, 48 cans/cs., \$6.00 and $3\frac{1}{2}$ -oz. cans, 48 cans/cs., \$3.00-3.50; Peru: light meat, solid pack in oil, 7-oz. cans, 48 cans/cs., \$6.00.

One of the leading brands of canned tuna on the Netherlands market is produced by the Peruvian subsidiary of a large California tuna cannery. As of the end of April the Peruvian subsidiary was reported unable to make offers for shipment to the Netherlands because canned tuna stocks from the 1958/59 catch were about exhausted. The latest offer from the Peruvian firm (April 15) for solid-pack tuna in oil was \$5.80 (probably f.o.b. Peru) a case of 48 7-oz. cans, the United States Consul at Rotterdam reported on April 29.

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IMPORTED CANNED TUNA PRICES, MAY 1959:

The following imported canned tuna prices c.i.f. Netherlands were reported by import trade sources early in May 1959. Japan: light meat tuna (skipjack or yellowfin) in cottonseed oil, solid pack, 7-oz., 48 cans/cs., US\$7.21; $3\frac{1}{2}$ -oz., 48

Norway

LOFOTEN AREA COD LANDINGS HIGHER IN 1959:

Reports from North Norway indicate that the 1959 cod fisheries in the Lofoten waters produced more fish and better earnings than in several years, despite record-low participation. The season was officially called off April 24, marking the departure of inspectors and fishermen alike. Between 9,000 and 10,000 fishermen took part in this year's venture on the Lofoten banks spawning grounds of the mature Arctic cod.

The total catch was 44,177 metric tons, which exceeded the 1958 quantity by about 11,000 tons. Largest landings were made by vessels operating out of Henningsvag and Svolvaer. First-hand value of the catch is estimated at some Kr. 44 million (US\$6,160,000). Earnings per fisherman for the 3-months season ranged from Kr. 4,000 to Kr. 8,000 (US\$560-\$1,120).

According to a Troms of newspaper, the result was fairly satisfactory. Fishermen using jigs and hand lines did especially well. For a while, though, rough weather forced vessels to stay in port many days. Storms also caused extensive loss of gear. (News of Norway, May 7, 1959.)

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COD FISHERY TRENDS, APRIL 1959:

Landings of spawning and spring cod as of April 18, 1959, in the Troms and Lofoten areas of Norway amounted to 100,551 metric tons. (As of April 24 Norway (Contd.):

spawning cod landings in the Lofoten area were reported to be 44,177 tons.) The landings through April 18 were substantially higher than the 89,813 tons landed in the same period of 1958.

Of cod landings from Troms and Lofoten, 64,270 tons were sold for drying, 15,293 tons for salting, and 20,088 tons for the filleting, freezing, and fresh trade.

The vessels fishing out of Møre og Romsdal and Sogn og Fjordane started long-line fishing on the deep-sea banks. Heavier landings of ling, cusk, and halibut are expected from those operations, the Norwegian fisheries periodical Fiskets Gang reported on April 23, 1959.

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SHIP FRESH FISH BY AIR:

In Aelesund--one of Norway's leading fishery centers--a new airport has recently been put into service. Lobsters, salmon, sea trout, oysters, etc., are shipped daily by plane more than 300 miles to Oslo to be consumed just a few hours after capture.

The airline operating between Aelesund and Oslo was established after extensive research into the fish-freight possibilities. The fishermen's associations that are making aerial fish shipments are especially interested in the success of the airline. (Industrias Pesqueras, Vigo, Spain, February 1, 1959.)



Panama

PINK SHRIMP FAIL TO APPEAR FOR SECOND TIME:

The Panamanian pink shrimp (Penaeus brevirostris) fishing season (usually starts in February or March) failed to materialize for the second straight year. In spite of the perfect setting of cold water (down to 70° F.), strong northeasterly winds and no rains, pink or "rojo" catches were extremely spotty and the total take was as low if not

lower than in 1958. White shrimp, however, have appeared this year before the beginning of the rains and are quite plentiful, but the catches have a high percentage of small immature shrimp. A proposed basic law for regulating the shrimp industry is under consideration.

The Taboga fish meal plant now has three purse seiners fishing with an average daily take of 60 tons of fish, primarily anchovetta. (United States Embassy, Panama, report of April 21, 1959.)



A fleet of shrimp trawlers at the pier of a Panamanian fishery company.



Peru

BONITO AND ANCHOVY CATCHES LOWER IN CHIMBOTE AREA:

Scarcities of anchovy and bonito in waters off Chimbote, Peru, have caused an increase in prices of Peruvian fish meal and canned bonito. The pack of canned bonito in 1958 amounted to about 600,000 cases--one third of the 1956-1957 pack. A recent survey showed that Chimbote's fish meal plants and bonito canning factories are operating at only 20-25 percent of capacity.

The fishery for anchovy to be used in fish meal manufacture has been good in the cold waters north and south of Callao. However, due to the long distance, fish from there cannot be shipped to Chimbote because it spoils en route. (Industrias Pesqueras, Vigo, Spain, March 15, 1959.)

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EXPORTS OF PRINCIPAL MARINE PRODUCTS, 1957-1958:

Expanding exports of fish meal at satisfactory prices continued to make the Peruvian fisheries industry one of

the bright spots in the economy. The value of fish meal exports in 1958 exceeded that of zinc or gold, and is expected to be higher in 1959. Most fish meal exports are to non-United States destinations. Peruvian suppliers have contracts to supply West Germany with fish meal needs for the first half of 1959 up to about US\$5 million.

Peruvian Exports of Principal Marine P	roducts, 195	7-1958
Products	1958	1957
	. (Metric	Tons).
Canned bonito	12,541	17,857
Fish meal	105,777	61,645
Frozen tuna	9,808	6,634
Frozen skipjack	6,073	5,337
Sperm oil	7,352	4,435

Shipments of frozen tuna and skip-jack to the United States increased 32.7 percent in tonnage from 1957 to 1958. Catches of tuna continued to be good in the first quarter of 1959. Two United States-owned operating companies in Peru had 13 United States flag vessels fishing for tuna out of Peruvian ports during most of the first quarter of 1959 and 5 more vessels are expected, according to a April 27, 1959, dispatch from the United States Embassy in Lima, Peru.



Fishermen put their boats into the water from the beach of the small bay north of Huarmey, Peru. Lima receives a large percentage of its supply of fresh fish from this type of fishing.

Poland

MOTHERSHIP EQUIPPED WITH HELI-COPTER-LANDING DECK AND ALL FACILITIES:

Polish herring drifters are now attended by a mothership, which has been constructed to provide the fishermen with all they need during work and leisure while on the fishing grounds.

Not only does she store the fish in refrigerated holds, supply the drifters with fuel and oil, water, salt, and barrels, and make repairs, but she is fitted with surgery and hospital facilities, a cinema and lecture room, and a library. She also has tailor, shoemaker, and barber shops.

In addition the use of a helicopter in times of emergency when rough weather precludes ordinary means of transfer, has been provided for by a special helicopter-landing deck on the poop.

A second auxiliary vessel operating with the drifter fleet carries the fish back to the home port.

A typical Polish mothership with the fishing fleets is about 470 feet long, with a speed of 13 knots, and a crew of 261.

Smaller fishing vessels such as drifters often experience great difficulty in mooring alongside bigger ships, risking the danger of severe damage by collision in rough seas. To meet this contingency the Polish mothership's hull has been strengthened by thicker plating along the waterline. When the drifters, loaded with herring, come alongside to unload their catch or load up with water and other necessities, four vessles can be accommodated at a time--two on each side of the mothership.

Her lifting capacity is greatly increased to facilitate the various deck operations needed to handle big catches of herring. This equipment includes six derricks around the foremast, including two side derricks and one 25-ton derrick. There are two 5-ton derricks forward of the forecastle, and two of three tons aft of the forecastle. The poop mast also has another four 5-ton derricks.

Economy in manpower has been achieved by installing electric-driven cargo winches, so that one man can control two winches--essential for swift and efficient lifting operations to the various decks.

Four electric capstans, each of three tons pulling power, are installed, and the two-shaft propelling plant has two propeller units, reciprocating engine, exhaust steam turbine, and two atmosphere water-tube boilers.

The steam turbine engines are reversible, and have two low-pressure and two high-pressure cylinders. Total output is 5,000 i.h.p. at 120 r.p.m. Electric power is generated by four steam turbine generator sets of 250 k.w. each.

Adequate supplies of drinking water for the drifters' crews are ensured by the use of two evaporators, which also supply water for the boilers. The speedy transfer of fresh water, fuel, and lubricating oil from the mothership to the drifters is facilitated by a set of pumps linked with the respective store containing these essential daily needs.

The hold of the mothership where the fish is stored until it can be transferred to the carrier vessel is cooled by refrigerating machinery, situated on the first tweendeck near the main propelling plant. This is of a compressor type arranged for direct cooling of the holds by a system of brine coils. The three compressors ensure the cooling of five holds 32° F. Two ammonia compressors are installed for cooling the provision store on the upper tweendeck. Special barrel conveyors have been provided for loading both upper and lower holds.

During loading operations at sea it is often necessary for the mothership to operate in deep water, and she has been provided with special deep anchoring, capable of a depth of 1,300 feet and additional to the normal bow and stern anchor equipment. This deep anchoring consists of a special davit, an anchor, a steel chain cable, and a cable stopper.

The drifters can be supplied with fuel, oil, and water at four different points of the mothership, and the problem

Poland (Contd.):

of mooring at sea has been solved by special floating and vertical fenders which hang down the sides of the ship. (The Fishing News, April 10, 1959.)



Portugal

CANNED FISH EXPORTS, JANUARY 1959:

Portugal's exports of canned fish during January 1959, amounted to 3,476 metric tons (189,000 cases), valued at US\$1.8 million as compared with 3,078 tons, valued at US\$1.8 million for the same period in 1958. Sardines in olive oil exported during January 1959 amounted to 2,371 tons, valued at US\$1.2 million.

Portuguese Canned Fish Exports, January 1959								
Species	Januar	y 1959						
	Metric	US\$						
	Tons	1,000						
Sardines in olive oil	2,371	1,206						
Sardine & sardinelike fish in brine	70	15						
Tuna & tunalike fish in olive oil	160	108						
Anchovy fillets	344	237						
Mackerel in olive oil	448	209						
Other fish	83	29						
Total	3,476	1,804						

During January 1959, the leading canned fish buyer was Italy with 695 tons (valued at US\$351,000), followed by Germany with 562 tons (valued at US\$289,000), United States with 415 tons (valued at US\$283,000), Great Britain with 354 tons (valued at US\$171,000), and Belgium-Luxenbourg with 282 tons (valued at US\$139,000). Exports to the United States included 200 tons of anchovies, 45 tons of tuna, and 162 tons of sardines. (Conservas de Peixe, March 1959.)

CANNED FISH PACK, JANUARY 1959:

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The total pack of canned fish for January 1959 amounted to 2,359 metric tons as compared with 2,560 tons for the same period in 1958. Canned sardines in oil (1,557 tons) accounted for 66.0 percent of the January 1959 total pack, lower by 20.6 percent than the pack of 1,960 tons for the same period of 1958, the March 1959 Conservas de Peixe reports.

Portuguese Canned Fish Pack, January 1959							
Product	Quan						
	In Metric	In 1,000					
	Tons	Cases					
In olive oil:							
Sardines	1,557	81					
Sardinelike fish	1	-					
Anchovy fillets	597	60					
Tuna	136	4					
Mackerel	2	-					
Other species	66	3					
Total	2,359	148					
Note: Values unavailable.							

* * * * *

FISHERIES TRENDS, JANUARY 1959:

Sardine Fishing: During January 1959, the Portuguese fishing fleet landed 4,051 metric tons of sardines (valued at US\$341,565 ex-vessel or about \$84.30 a ton).

Canneries purchased 52.7 percent or 2,133 tons of the sardines (valued at US\$185,496 ex-vessel) or about \$86.90 a ton) during January. Only 25 tons were salted, and the balance of 1,893 tons was purchased for the fresh fish market.

Other Fishing: The January 1959 landings of fish other than sardines were principally 6,441 tons of chinchards (value US\$207,409). (Conservas de Peixe, March 1959.)

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EFFECT OF EUROPEAN COMMON MARKET ON FISH CANNING INDUSTRY:

The Portuguese fish canners have expressed the view that the European Common Market is a bad omen for the fish canning industry, especially if Morocco should join this group or become associated with a Free Trade area because of its special relationship to France. Several important canners reaffirmed their industry's fear of Moroccan competition and pointed out that there had been an increase of exports of fresh Moroccan sardines to France for canning in the latter country. It was pointed out that the six Common Market countries consumed from 50-60 percent of total Portuguese sardine exports and loss of this market to Morocco would have a serious effect on the industry. Most sources felt that sales to the United States could be increased, provided that the industry

Portugal (Contd.):

greatly reduced the great number of brand names and invested more heavily in advertising in the United States.



Singapore

MARKET FOR CALIFORNIA SARDINES:

Prior to 1952 California sardines (pilchards) enjoyed a substantial market in the Singapore area and most of the

Table 1 - Singapore's Imports of Canned Sardines and Pilchards by Country of Origin and Value, 1958

, , , , , , , , , , , , , , , , , , , ,							
Product & Country of Origin	Quantity	Value	±1/				
Sardines: Union of South Africa Japan Norway Portugal Canada Netherlands United States Other	900 80 18 12 11 4 3 4	M\$1,000 1,084 96 62 25 26 5 9 11	354 31 20 8 8 1 3				
Total Sardines Pilchards: Union of South Africa Other	1,032 2,109 1	1,318 2,439 1	428 798 2/				
1/Values converted at rate of M\$3.0 2/Value less than US\$500.	055 = US\$1.						

shipments were made through Singapore. After the failure in catches of California sardines during the period 1952-57, Singapore importers of sardines established trading contacts with suppliers in South Africa and Japan. Currently importers in Singapore have committed themselves to these packers for supplies and the immediate prospects for increasing sales of California pilchards are not bright. However, it is believed that a sales promotion campaign could do much to re-establish the California packers' position in this market. Certain developments have taken place which may prevent the development of the market through Singapore to regain its pre-1952 level. An important factor is the existence of a customs duty of 25 percent in the Federation of Malaya on non-Commonwealth pilchards as compared to an imperial preferential duty of only 10 percent. Another factor is the gradual development of direct trading channels in many of the markets previously supplied from Singapore.

During the five-year period of 1954-58 the average annual quantity of sardines and pilchards retained in Malaya was about 2,359 long tons of which approximately 90 percent were consumed in the Federation of Malaya and the remainder in Singapore. During the same period average annual exports to surrounding areas (excluding the Federation) amounted to 1,437 long tons. According to reliable sources about 55 percent of total imports of sardines and pilchards into Malaya are consumed in the Federation of Malaya.

There are no figures showing inventories of pilchards and sardines held in Singapore and the Federation. Market sources indicate, however, that a three months supply is normally stocked and that stocks are estimated at about 800 long tons.

Importers report that consumers prior to 1957 preferred California pilchards over any other because they tended to

be fatter and contain more oil than competitive brands. Price factors, of course, are of considerable importance and California products at the present time suffer a disadvantage because of the preferential treatment accorded South African sardines in the Federation of Malaya.

There are some prejudices against Japanese products as a result of the Japanese occupation of this area during the war, but these prejudices are rapidly diminishing and the Japanese are in a relatively favorable competitive position in the market at the present time.

It is doubtful that much of the 1958 pack of California pilchards can be placed in the area served by Singapore since most importers have already committed themselves to South Africa or Japan for supplies. Traders report that they were discouraged from placing orders with California packers because of the relatively high prices quoted, reported to be as much as US\$9.00 f.o.b. Los Angeles for ovals. Prices of California pilchards, they report, have been substantially reduced in recent weeks and more interest has been expressed in these supplies, particularly for the 1959 pack.

Importers in Singapore state that Japanese suppliers have labeled sauries and horse mackerel as sardines because of consumer preferences. At one time certain brands of South African pilchards were also labeled as sardines for shipment to markets where such labeling improved sales. The Singapore Government is now more strict about labeling requirements and has prevented such mislabeling (United States Consul at Singapore, April 10,1959).

Table 2 - Singapore's 1/ Imports of Sardines and Pilchards, 1954-58 Product Quantity Value Long Tons M\$1,000 US\$1,000 Sardines: 1.031 1,317 431 1958 1957..... 2,437 1,942 798 1956...... 1,634 535 1,432 1955...... 867 284 1954...... 1,062 1,383 453 7,638 Total.... 6,181 2,501 Pilchards: 1958... 2,110 799 2,441 1957..... 2,639 3,131 1,025 1956..... 2,755 3,207 1,050 1,165 1955...... 3,229 3,559 1954...... 2,066 2,451 802 Total.... 12,799 14,789 4,841 1/Exclusive of trade between Singapore and the Federation of Malaya.

Table 3 - Singapore's 1/ Exports of Sardines and Pilchards, 1954-58

Product	Quantity	Va	lue
Sardines: 1958. 1957. 1956. 1955. 1954.	Long Tons 1,812 1,301 1,452 1,170 995	M\$1,000 2,145 1,573 1,696 1,316 1,115	US\$1,000 702 515 555 431 365
Total Pilchards: 1958 1957 1956 1955 1954	6,730 59 64 74 124 135	7,845 71 72 85 140 152	2,568 23 24 28 46 50
Total	456 en Singapore and the Fe	520 deration of Malaya	171

Singapore (Contd.):

Table 4 - Prices (c.i.f.) at Singapore April 1959 for Canned Pilchards and Competing Canned Fish Products										
Cases	Japan					South African		ifornia		
Cases	Sau	гу	Jack Mackerel		Pilchards					
(All tomato sauce):	<u>M\$/cs</u> .	US\$/cs.	M\$/cs.	US\$/cs.	M\$/cs.	US\$/cs.	M\$/cs.	US\$/cs.		
48-16 oz. Oval	23.00	7.53	19.05	6.24	-	-	24.70	8.09		
48-16 oz. Tall	21.50	7.04	18.70 6.12		22.00	7.20	21.35	6.99		
96- 9 oz. Tall 48- 8 oz. Tall	25.00	8.18	21.60	7.07	12.70	4.16		-		
100-5 oz. Round	20.00	6.55	18.50	6.06	20.80	6.81	-	-		



Sweden

FISHERMEN OFFERED INSURANCE ON LING CATCHES:

The Swedish High Seas Fishermen's Sales Association in Goteborg has decided to arrange for insurance on ling catches for its members. For example, in case of engine breakdown, such a policy would give a fisherman a certain compensation for the catch which he normally would have made if the engine had not failed.

This type of insurance is of great importance to the fishermen, according to the Chairman of the Association. Vessels holding such policies will be reimbursed for oil, ice, bait, and salt expenditures and also for loss of income up to an amount of 20,000 crowns (US\$3,866) in case of a broken trip.

The interest of Swedish fishermen in ling fishing north of the Hebrides and Shetland islands has increased and 40 vessels have this year announced that they plan to participate, as compared with 30 vessels in 1958. The first boats were scheduled to leave about the end of April and some boats plan to make two trips, the United States Consul in Goteborg reported on April 21, 1959.

Ex-vessel prices are the same as in 1958 or 1.00 crown per kilo (8.8 U. S. cents a pound) for fresh ling, 0.60 crown per kilo (5.3 U. S. cents a pound) for

fresh cod, and 0.50 crowns per kilo (4.4 U.S. cents a pound) for salted ling.

* * * * *

OSCILLOSCOPE AND ELECTRIC GROUND WIRE DEVELOPED AS AID TO NAVIGATION:

Navigation of a vessel along an electric wire placed on the sea bottom was recently demonstrated in the Sound between Sweden and Denmark by two Swedish inventors from Malmo, Sweden. A film of the demonstration was shown on the Swedish television circuit on May 7, 1959.

An electric wire in the form of a triangular track was laid at the bottom of the Sound and the navigator of a motor boat followed the electric wire with the assistance of an oscilloscope. The navigator operated in a closed room and had no view in any direction, thus being restricted to navigating solely with the aid of the oscilloscope and the electric wire.

When a vessel fitted with an oscilloscope is above the electric wire, an arrow on the instrument used by the navigator will point straight down. Should the vessel deviate from the wire, for example starboard, the arrow will point to the port side of the vessel, or vice versa.

This system of navigation, it is claimed, could be very useful in narrow channels and ports as well as in darkness and fog.

Sweden (Contd.):

The electric wire was connected to the ordinary Malmo city lighting system, the United States Consul in Goteborg reported on May 8, 1959.

* * * * *

FACILITIES FOR QUICK-FREEZING FISH EXPANDED:

The Helsingborg Cold Storage Plant in Helsingborg has opened a new large fish-filleting section which was constructed by a large Swedish fish-processing company.

The processing room has four automatic filleting machines, two of which are rented from another Swedish fish-processing company, with a total capacity of 1,500 half boxes of cod (containing 45 kilos or about 99 pounds) in 10 hours. The volume of the storage space in the plant amounts to 67,000 cubic meters and the freezing capacity for herring is about 30,000 half boxes a week.

During a recent visit of West Coast fishermen to the plant, the director of the operating company told them that his company first of all wishes to take care of fish caught by Swedish fishermen, and that imports will be limited to fish which cannot be supplied by Swedish fishermen. The director also said that the company has decided that fish more than two days old cannot be used for preparation of top-quality products.

The director also said that because of its size the new fillet section cannot be made to pay if fishing for cod is carried on for only 4 to 6 weeks, as in the Baltic at present. He raised the question whether fishing for cod in the Baltic could not start in January rather than in the middle of April.

Quick-freezing as a method of preservation is relatively new in Sweden and will therefore be subject to many improvements, according to the director of the Helsingborg plant. No one could have anticipated, he said, that quick-frozen cod fillets would have become as popular as they are today. Also, no one believes that the present system of freezing herring, which now is done relatively slowly,

with the herring in boxes containing 45 kilos, will continue in the future.

Research work at the cold storage plant regarding freezing and storage of herring deals with important problems, such as the storage fitness at different temperatures and preservation methods. Other factors, such as the freezing velocity when herring is frozen in boxes compared with freezing of herring in chunks or in various other packing material is also being investigated, the United States Consul in Goteborg reported on May 11, 1959.

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FISHING INDUSTRY, 1958:

Preliminary data on the landings of fishery products by the Swedish fishing fleet in 1958 indicates a total of 215,206 metric tons (474.3 million pounds) landed at home and abroad in 1958, an increase of 6 percent as compared with 1957, when 202,100 metric tons (445.4) million pounds) were landed, but 2 percent less than the total landings in 1955 (the largest landings on record) when 219,900 metric tons were landed. The figures include fish for industrial purposes, such as used in the production of fish oil and fish meal. The latter category has during the latter years increased and represented in 1958 over 12 percent of the total landings at home and abroad.

Landings in Sweden accounted for 69 percent of the total landed and the remaining 31 percent were landed in Denmark, West Germany, and Great Britain. Compared with 1957, the quantities of fish landed in Sweden dropped by 10 percent, while the landings abroad increased by 76 percent.

The total value of the 1958 landings increased by 3 percent and amounted to 149.1 million crowns (US\$28.8 million) as compared with 145.2 million crowns (US\$28.0 million) in 1957. The value of the 1958 landings exceeded the 1955 value by 12 percent. The increase in the value of the catch in 1958 originates from landings abroad, which increased by 66 percent as compared with 1957, while the value of the landings in Sweden dropped by 6 percent.

Sweden (Contd.):

Herring landings made up 45 percent of the total catch and increased by 6 percent over 1957. Baltic herring, which made up 9 percent of the total catch in-

1957, a decrease of 10 percent. This decrease orignates from the West and South Coast areas, where the landings dropped by 18 and 2 percent, respectively. The landings on the East Coast on the other hand increased by 20 percent.

Table 1 - Swedish Fish Landings	by Main	Species	(including	landings i	nforeign	ports)				
Species	Quan	tity	Value							
	1958	1957	1958	1957	1958	1957				
Herring and Baltic herring:	.(Metric	Tons).	. . (Sw. Kr	. 1,000)	. (US\$	1,000).				
Herring	97,112	92,028		46,029	9,718	8,884				
Baltic herring	19,370	14,044	. ,	8,909	2,029	1,719				
Cod	26,932	32,059	17,561	19,432	3,389	3,750				
Haddock	5,987	6,832	5,717	5,903	1,103	1,139				
Whiting	2,778	2,137	2,101	1,575	405	304				
Ling	3,057	3,531	3,032	3,384	585	653				
Other cod	5,086	6,825	4,490	5,282	867	1,019				
Mackerel	13,287	11,952	9,230	7,885	1,781	1,522				
Sprat	2,188	3,470	3,670	4,838	708	934				
Other	$ \frac{1}{2}/9,113 $	10,223	32,7 5 4	34,274	6,322	6,615				
Not specified	4,351	4,879	5,202	5,530	1,004	1,067				
Industrial fish	25,945	14,118	4,452	2,159	859	417				
Total		202,100	149,070	145,200	28,770	28,023				
1/Includes: flatfish 2,721 tons; eel 1,487 tons;	/ Includes: flatfish 2,721 tons; eel 1,487 tons; salmon species 1,222 tons; and shellfish 3,683 tons.									

creased by 38 percent, and mackerel, which comprised 6 percent of the total catch, increased by 11 percent. Groundfish species, comprising 20 percent of the total catch, decreased on the other hand by 15 percent. Sprat dropped by 37 percent and landings of eel and salmon decreased by 22 and 16 percent respectively.

The total quantity of fish landed in Sweden amounted to 148,438 metric tons as compared with 164,125 metric tons in The total quantity of fish landed in foreign ports in 1958 by Swedish fishermen amounted to 44,583 metric tons as compared with 28,347 metric tons in 1957. Herring increased by 57 percent as compared with 1957 and made up 67 percent of the total landings abroad. The landings of herring in German and British ports dropped considerably and were slightly more than one-fourth of the landings in 1957, while the landings in Denmark increased by 185 percent. Other species landed in foreign ports

Table 2 - Swedish Fish Landings in Swedish Ports Only by Main Species									
Species	Qua	ntity		Value					
Species	1958	1957	1958	1957	1958	1957			
	.(Metric	c Tons).	(Sw. Kr	1,000)	(US\$	1,000)			
Herring and Baltic herring:									
Herring	52,529	63,681	28,016	32,156	5,407	6,206			
Baltic herring	19,370	14,044	10,511	8,909	2,029	1,720			
Cod	26,329	31,655	17,163	19,123	3,312	3,691			
Haddock	5,287	6,057	5,221	5,373	1,008	1,037			
Whiting	2,246	1,974	1,754	1,478	338	285			
Ling	3,034	3,481	3,019	3,364	583	649			
Other cod	4,297	6,189	3,917	4,823	756	931			
Mackerel	8,416	10,060	6,317	6,930	1,219	1,337			
Sprat	2,111	3,206	3,572	4,641	689	896			
Other	$\frac{1}{9},077$	9,999	32,695	33,944	6,310	6,551			
Not specified	4,209	4,610	5,087	5,286	982	1,020			
Industrial fish	11,533	9,179	2,143	1,318	414	254			
Total	148,438	164,135	119,415	127,345	23,047	24,577			
1/ Includes: flatfish 2,685 tons; eel 1,487 tons	; salmon spec	ies 1,222 ton	s; shellfish 3	683 tons.					

Sweden (Contd.):

increased even more. Cod, for example, increased by 449 percent, mackerel by 255 percent, and industry fish by 195 percent.

In terms of value, 90 percent of the landings abroad came from Denmark, 5 percent from Great Britain, and 5 percent from West Germany, as compared with 49, 24, and 27 percent, respectively, in 1957.

Swedish exports reached a new record in 1958. Sweden's exports of fish and fish products in 1958 (including direct landings) had a value of 70 million crowns (US\$13.5 million) compared with 60 million crowns (US\$11.6 million) in 1957. Direct landings in Denmark which increased in value from 8.7 million crowns (US\$1.7 million) in 1957 to 26.6 million crowns (US\$5.1 million) in 1958 were responsible for the increase. The quantity of fish landed in Danish ports rose from 21,500 metric tons in 1957 to almost 62.000 metric tons in 1958. The total value of the direct landings in all foreign ports increased from 18 million crowns (US\$3.5 million) in 1957 to almost 30 million crowns (US\$5.8 million) in 1958.

While the direct landings increased greatly last year, exports of fish and fish products from Sweden dropped slightly from 42.2 million crowns (US\$8.2 million) in 1957 to 39.9 million crowns (US\$7.7 million) in 1958. The large direct Swedish landings made Denmark the leading importer of fish and fish products from Sweden in 1958. Danish imports totaled 32.5 million crowns (US\$6.3 million) in value and thus represented almost 50 percent of the total value of Sweden's exports of fish and fish products. (It is of interest to note that the main part of the direct landings in Denmark is re-exported to other countries, chiefly West and East Germany.)

Exports to East Germany, which prior to 1958 had been the main market for Swedish fish and fish products, declined in value to 12.7 million crowns (US\$2.5 million) in 1958 from 20 million crowns (US\$3.7 million) in 1957.

Swedish imports of fish and fish products in 1958 increased by over 20 million crowns (US\$3.7 million) over 1957 and totaled 106 million crowns (US\$20.5 million). The greatest import increase consisted of frozen fish fillets, which increased by almost 50 percent in value or 13.6 million crowns (US\$2.6 million). Imports of frozen fish fillets increased in quantity by over 40 percent compared with 1957 and reached a record. More than 70 percent of the quantity of imported frozen fish fillets came from Norway in 1958 and were as great as the entire import of frozen fillets from all countries in 1957.

The average price per pound for the 1958 catch (excluding fish for industrial purposes) amounted to 6.7 U. S. cents and remained unchanged from 1957. The average price for most species was somewhat higher than in 1957; for example sprat increased from 12.2 U. S. cents a pound to 14.7 U. S. cents a pound in 1958. On the other hand the price for Baltic herring and shrimp dropped.

The average price for herring landed in foreign ports by Swedish fishermen amounted to 4.4 U. S. cents a pound, which was somewhat lower than the price received at the fish auction in Goteborg, which was about 9.8 U. S. cents a pound. Landings in West Germany brought the highest price, or an average of 5.8 U. S. cents a pound, as compared with 4.3 U. S. cents a pound in Danish and British ports. (United States Consul dispatch from Goteborg, dated May 19, 1959.)

Note: Values converted at rate of 1 Swedish kronor or



Tunisia

FISHERIES LANDINGS INCREASED SINCE 1955:

crown equals US\$0.193.

Landings of fish and shellfish in Tunisia have increased from 10,533 metric tons in 1955 to 14,937 tons in 1958. The increase has been gradual-landings of 11,607 tons in 1956 were 10.2 percent above 1955 and the 13,789 tons landed in 1957 were about 18.8 percent above 1956.

Tunisa (Contd.):

Fishing is a common occupation all along Tunisia's 812-mile coastline. The most important fishing area is the Gulf of Gabes in which Tunisia claims exclusive fishing rights out to about 27.3 fathoms (50 meters). Most fishing is carried out close to shore with simple equipment. A small sponge fishery has existed for many years out of Sfax and Djerva. (United States Embassy dispatch from Tunis, dated May 11, 1959.)



Union of South Africa

UNION OF SOUTH AFRICA AND SOUTH-WEST AFRICA CANNED FISH PRODUCTION AND MARKETING, 1958:

Landings of pilchard (sardine) and jack mackerel (maasbanker) by the Union of South Africa's fishermen in 1958 were the best since 1952 and marked the first year since the establishment of the quota in 1952 that the 250,000-ton quota was exceeded. The South African Division of Fisheries declared the season for pilchards and jack mackerel (maasbanker) fishing closed on August 31, for the balance of the year. The season for the catching in South-West African waters was closed shortly after this date, when the 250,000-ton quota was reached. Landings in South Africa in 1958 for the canning and fish meal industries totaled 298,854 short tons as compared with 219,615 tons in 1957. Total landings were made up of 214,533 tons of pilchards (1957-118,524 tons), 62,190 tons of jack mackerel (1957-93,218 tons), and 22,131 tons of true mackerel (1957-7,873 tons). Landings for canning and reduction in South-West Africa were 257,592 tons in 1958 as compared with 254,976 tons in 1957.

Fish Canning: Fish canners in South Africa and South-West Africa reportedly paid about ±4.10s. (US\$12.60) a ton ex-vessel for pilchards, jack mackerel, and true mackerel in 1958. During the first nine months of 1958 (preliminary data) the South African fish canners packed 3,317,586 cases of pilchard, 296,098 cases of jack mackerel, and 93,885 cases of true mackerel. Nearly all canning operations had ceased by September.

Fish Meal: Preliminary estimates of fish meal production in 1958 by the Union of South Africa totaled 56,170 short tons and production in South-West African for the same period amounted to 46,277 tons. From January 1 to November 30, 1958, the Union consumed 19,781 tons; 35,915 tons were exported; and 4,335 tons were on hand as of that date. For the January 1- November 30, 1958, period, South-West Africa sold 1,753 tons in the local market, exported 47,566 tons, and had 6,703 tons on hand as of November 30. At the end of 1958, according to trade estimates, not more than 2,000 tons were on hand.

<u>Fish Oil</u>: The production of fish oil in 1958 by Union of South Africa totaled 13,392 long tons and by South-West Africa 10,751 long tons. Exports from both areas for the first eleven months of 1958 amounted to 14,356 long tons; local consumption was 8,459 long tons; and inventories as of November 30, 1958, were 3,327 long tons.

Canned Fish Exports and Inventories: Estimates for the period January 1- September 30, 1958, indicate exports of 2,138,412 cases of pilchards, 276,122 cases of jack mackerel, and 58,324 cases of true mackerel from the Union and South-West Africa. Inventories as of September 30, 1958, were 1,999,196 cases of pilchards, 18,111 cases of jack mackerel, and 8,651 cases of true mackerel. Year-end 1958 inventories were estimated to be not more than 750,000 cases. Although the pack of canned pilchards, jack and true mackerel was up about 600,000 cases in 1958 as compared with 1957, December 31, 1958, inventories were estimated to be about 200,000 cases under the quantity on hand December 31, 1957.

Canned Fish Prices: Prices f.o.b. Cape Town for canned fish fluctuated only slightly according to trade sources in South Africa. The f.o.b. prices varied according to foreign marketing area. The South African fish canners attempt to adhere closely to price quotations recommended by the South African Association of Fish Canners. The price schedules are drawn up after consultations between the individual canners and the Association.

Competitive Position and Market Prospects: South African fish canners have not thus far expressed any serious concern over the present competitive position of their products on the international market. The countries most frequently mentioned as competitors are Japan in the Far Eastern market and the Netherlands in the West African market. Of these two countries, Japan is regarded as the most serious threat. Local sources report that Japanese pilchards are generally quoted slightly higher in the Philippine market than those from South Africa. It is believed, however, that the Japanese mackerel pike or saury is offering increasing competition to South Africa. Several local exporters have nevertheless estimated that shipments to the Philippines in 1958 exceeded those of the previous year.

Table 1 - Canned Pilchard and Jack Mackerel January 1959 Prices f.o.b. Cape Town, South Africa								
Product	Cans/Cs.	For Philippines	For Malaya <u>1</u> /	For United Kingdom <u>2</u> /				
Pilchard: (US\$ Per Case)								
15-oz. tall, tomato	48	6.10	7.00	6.21				
15-oz. tall, natural	48 48	5.85 -	- 7.74	7.58				
8-oz. buffet, tomato $5\frac{1}{2}$ -oz. jitney, tomato	48	4.22	-	3.96				
$5\frac{1}{2}$ -oz. jitney, tomato	100 48	6.04	6.74	6.58 3.28				
Jack Mackerel: 15-oz. tall, natural	48	4.95						
15-oz. tall, tomato	48	4.95	6.44	-				
1/ All Malayan prices less 5 percent. 2/ All United Kingdom prices less $2\frac{1}{2}$ percent.								

Union of South Africa (Contd.):

With respect to the Philippine market, South African canners consider that their most serious competitive disadvantage is presently that of delivery time. Only a monthly service presently is available out of Cape Town and transit time requires 30 days. Both the United States and Japan can offer shorter delivery dates. It may also be of interest to note that South African canners do not consider their pilchards as a serious competitor to the United States product in the Philippines. The latter product, it is reported in South Africa, is regarded as of a generally higher quality and is sought by a consumer class different from that buying South African pilchards.

Canners in the Union of South Africa appear to be uniformly optimistic that the pilchard catch in 1959 will be as good as that of 1958. There is, however, some concern

over marketing prospects in the coming year. Assuming that the total catch of pilchards, jack mackerel, and mackerel again approaches 300,000 tons, it is believed that total production of canned fish will increase further due primarily to a steady improvement in the level of efficiency in canning factories. At the present time it is estimated that on an average, from 12-13 cases, consisting of 48 1-lb. cans per case, are produced from one ton of raw fish. As canneries have been gaining experience this figure has gone up and is expected to register further improvement. Due to the early shut down in 1958, Union canners have also had more time to recondition and improve their factories.

There is no question that local canners could afford to lower their prices on the international market if such a step becomes necessary. There are, incidentally, no Government subsidies covering the export of South African fishery products. The Government does, however, participate in a vigorous and extensive fisheries research pro-

Table 2 - Union of South Africa and South-West Africa Canned Pilchard and Mackerel Pack and Distribution, January-September 1958

Product, Type of	Net Wt.	No.	Pack	Export	Domestic	Inventory
Can & Pack	Per Can	Cans/Cs.	Fack	Export	Sales	9/30/58
Pilchards:	Oz.			(C:	ases)	
Ovals, tomato	15	48	105,788	79,643	10,353	40,076
Ovals, natural	15	48	-	_	-	_
Talls, tomato	15	48	680,541	488,347	47,234	517,335
Talls, natural	15	48	394,818	271,845		171,825
Oval, tomato	15	24	170,085	96,061	_	74,024
Oval, natural	15	24		_	_	_
Buffet, tomato	8	48	653,157	541,655	47,988	432,550
Buffet, natural	8	48	61,361	24,352	14,592	52,905
Halves, tomato	8	48	24,408	17,220	14,523	10,598
Halves, natural	8	48	7,514	2,276		1,699
Jitney, tomato	$5\frac{1}{2}$	100	645,022	391,971	740	352,278
Jitney, natural	$5\frac{1}{2}$	100	75,572	53,019	-	48,469
Jitney, tomato	$5\frac{1}{2}$	48	344,650	167,612	41,388	155,536
Jitney, natural	5 5 5 5 5 5	48	6,169	1	7,027	98
12 oz. 1/. tomato	12	48	122,272	1,460	2,500	118,312
12 oz. $\overline{1}$ /, natural	12	48	26,229	2,950	1,000	23,491
Totals	-	_		2,138,412	217,349	1,999,196
Jack Mackerel:						
Ovals, tomato	15	48	-	-	272	_
Ovals, natural	15	48	-	75	118	-
Talls, tomato	15	48	20,721	12,099	9,604	528
Talls, natural	15	48	223,217	233,395	27,192	10,729
Rounds, tomato	14	48	_	_	-	_
Rounds, natural	14	48	-	-	438	-
Buffet, tomato	8	48	1,305	473	2,561	682
Buffet, natural	8	48	107	_	100	7
Halves, tomato	8	48	14,933	2,905	12,105	1,274
Halves, natural	8	48	35,815	27,175	13,422	4,891
Totals	-	_	296,098	276,122	65,812	18,111
True Mackerel:						
Talls, tomato	15	48	3,405	3	2,362	697
Talls, natural	15	48	78,055	56,475	30,021	2,853
Halves, tomato	8	48	3,473	197		792
Halves, natural	8	48	7,952	1,648	8,633	3,959
Rounds, tomato	14	48	_	-	31	117
Rounds, natural	14	48	1,000	1	923	233
Totals	_	-	93,885	58,324	46,727	8,651
Grand Total	_		3,707,569	2,472,858	329,888	2,025,958
1/ New can size (used for string bear	ns) introduced	l in 1958 which	has not prove	n very successf		discontinued.

Union of South Africa (Contd.):

gram. As has been previously reported, Government controls do exist which limit the annual catch of pilchards and jack mackerel in the Union of South Africa and in South West Africa.

Should the industry's present optimism over fishing prospects in the current year prove well founded, total production of canned pilchards, jack mackerel, and mackerel in the Union of South Africa and South-West Africa might easily reach or even slightly exceed 4,000,000 cases.



Union of South Africa and South-West Africa

UNION AND SOUTH-WEST AFRICA FISH CATCH, 1958:

In 1958, for the first time in the history of the Southern African fishing industry, the total fish catch for the Union and South-West Africa passed 700,000 short tons. The total of 714,000 tons was more than 20,000 tons higher than the 1952 record catch of 693,688 tons. It was nearly 100,000 tons higher than the catch in 1957.

The big increase in calendar year 1958 was largely due to the good catches of pilchards, maasbanker, and mackerel off the Cape west coast. After several indifferent seasons, the 14 factories along some 200 miles of coast from Hout Bay to Thorn Bay processed 298,854 short tons of pelagic shoal fish (pilchard, maasbanker, and mackerel), compared with 219,615 tons in 1957 and 170,316 tons in 1956. The total catch was second only to the 300,560 tons landed in 1952.

Maasbanker landings of 62,190 tons compare with 93,218 tons in 1957 and 50,233 tons in 1956. The record for this fish was 130,228 tons in 1954.

The mackerel catch of 22,131 tons compares with 7,873 tons in 1957 and the record 35,927 tons in 1956.

For the fifth successive year the trawled fish catch set a new record and passed 100,000 tons for the first time. The total catch of 82,871 tons of dressed fish plus 20,570 tons of "offal" (waste after dressing fish) was 103,441 tons.

Although the spiny lobster catch of 8,000 tons was below the 14,000 tons landed in 1957, the estimated line fish and snoek catch remained at about 36,000 tons.

The South African Trawl fish catch (including offal) rose from 199,928,092 pounds in 1957 to 206,882,186 pounds in 1958. The catch (in pounds) was made up as follows (with 1957 figures in brackets): hake 137,972,319 (133,312,067), kingklip 2,662,491 (2,399,411), sole 2,325,071 (2,505,317), kabeljou 1,066,509 (1,338,546), pangas 4,461,036 (6,862,623), silverfish 238,055 (545,338), angelfish 2,725 (5,726), gurnard 591,918 (186,492) jacopever 2,120,895 (1,390,181), john dory 6,150 (86,559), maasbanker 4,569,429 (2,173,334), skate 65,585 (47,914), steenbras 6,031 (59,714), stonebass nil 13,200), stumpnose red 235,408 (75,042), stumpnose white 1,150 (91,300), heads 3,190,900 (3,290,550), shark livers 4,767,127 (3,792,267), hake livers 78,158 (555,147),

Table 1 - Union of South Africa's and South-West Africa's Shoal Fish Landings and Fish Meal and Oil Production, Fiscal Years 1/1956/57-1957/58

and Fish Mear and Off Froduction, Fiscar Tears 27 1000/01 1001/00									
	Landin	gs Fish	Production of 3/						
Area	Shoal $\frac{2}{}$		Fish Meal		Fish Oil				
	1957/58	1956/57	1957/58						
		(Short Tons) (Long							
Union of South Africa	303,135	183,592	61,746	35,553	13,667	10,207			
South-West Africa	257,064	245,134	46,380	44,910	10,772				
Total	560,199	428,726	108,126	80,463	24,439	19,640			

1/ Accounting fiscal year (October 1-September 30) as used by the Fisheries Development Corporation of South Africa. Figures different than given in text for calendar years.

 $\frac{2}{3}$ / Pilchards, maasbanker or jack mackerel, and mackerel. $\frac{3}{3}$ / Pack of canned fish not given.

The record pilchard catch of 214,533 tons, compared with 118,524 tons in 1957 and 84,156 tons in 1956. The previous highest figure for pilchards was 187,424 tons in 1952.

roes 317,614 (342,801), squid 290,493 (216,275), other fish 773,122 (475,287), and offal 41,140,000 (40,256,000).

The total Union of South Africa fish catch was, therefore, 446,295 tons, com-

Union of South Africa and South-West Africa (Contd.):

pared with 359,879 tons in 1957, 311,429 tons in 1956, and the previous record total of 427,268 tons in 1952.

South-West Africa's Walvis Bay's pilchard industry keeps as close as pos-

2,500 tons of snoek, 2,500 tons of whitefish and about 5,000 tons of spiny lobster, the total South-West African catch was just under 268,000 tons.

The general condition of the fish landed in the Union in 1958 was such that processing results were a trifle disappointing and, as in the case of the previ-



Aboard a South African spiny lobster fishing boat at the dock prior to unloading. Boat fished in Hout's Bay area.

sible to the 250,000-ton yearly quota, although in calendar year 1958 it rose slightly above that limit to 257,592 tons, compared with 254,976 tons in 1957 and 251,047 tons in 1956. With an estimated

ous season, the optimum yields of earlier years were not achieved. Once again the main shoals were found well south of St. Helena Bay, the main center of the Union's industry. The industry based on Walvis

Union of South Africa and South-West Africa (Contd.):

Bay enjoyed another highly successful season.

The overseas demand for fish meal remained very firm throughout 1958. The poor winter herring season in Norway contributed towards this situation. Export sales were effected readily at favorable prices after the demand of the local market had been satisfied at an agreed price considerably below that obtained on foreign markets. The Union and South-West Africa occupy a very prominent position in world fish meal markets, being second only to Norway as exporters of that commodity.

The overseas demand for fish body oil did not, however, follow the same pattern, but fell considerably as a result of butter and fat surpluses in Europe. As a consequence, the average selling price per long ton of fish body oil revealed a significant drop, but the industry was able to offset this in some measure by taking advantage of the reduced rates for bulk tankers. On balance, however, producers had a satisfactory year.

While factories at Walvis Bay recorded heavy production of canned fish over the past season, the output of Union factories was limited by the condition of the fish delivered to them after a moderately long haul from the catching area. The sales of canned fish were satisfactory at profitable prices.

The demand for frozen spiny lobster remained very firm at satisfactory prices, but the difficulties in this aspect of the inshore industry lie in the catching side, where an imbalance has manifested itself as between different fishing areas. Whereas some areas reported satisfactory landings albeit at the price of greater effort, others suffered a very serious fall in catch, a development which was faithfully reflected in the accounts of the companies concerned.

Note: Also see Commercial Fisheries Review, March 1959, p. 68.



U. S. S. R.

TUNA VESSELS REPORTED FISHING NEAR CAROLINE ISLANDS:

According to a report from a Japanese tuna fishing vessel, a Russian fishing vessel was sighted fishing for tuna in the Caroline Islands area on February 17, 1959. At the time of the sighting, tuna were being hauled aboard the Russian vessel. The crew appeared to consist of about 20 persons, including some women. Another Russian vessel was reported sighted nearby.

Prior to the sighting of these Russian vessels, the Russians had announced that they might enter the Pacific tuna fishery and in October 1958 a fishery survey vessel had departed for an exploratory tuna fishing survey (Pacific Islands Monthly, March 1959).

* * * * *

EXPANSION OF OCEAN RESEARCH PLANNED:

Soviet marine scientists are to extend their ocean research activities considerably during the next few years. In 1959, two new research vessels, the Voeikov and the Shokalsky, will make their maiden voyages to the Pacific Ocean. The two new research ships were named after prominent Russian oceanographers.

The Vityaz, the largest research vessel which was engaged in oceanographic investigations in the North and South Pacific in 1958 and also visited San Francisco in November 1958, will conduct surveys in the Indian Ocean in 1959.

* * * * *

SUBMARINE RETURNS FROM FISHERY RESEARCH CRUISE. The Soviet submarine Severyanka (The Northerner), which has been converted to conduct research for the fishing industry, returned early this year from a successful 24-day scientific cruise, having covered some 4,000 miles since leaving the Kola Peninsula. This was the submarine's second voyage. The maiden trip was undertaken in the Barents Sea following her trials.

Manning the vessel on the research side were young scientists from the U.S.S.R. Institute of Marine Fisheries and Oceanography.

The expedition established at what time of the day or night and at what depth various kinds of fish are most likely to be located. Interesting conclusions were drawn concerning the reaction of fish, particularly herring, to the sub's searchlights. It was ascertained that at night the herring were in a passive state and did not react in any way to the advance of

U. S. S. R. (Contd.):

the vessel nor to the glare of her lights. From 8 a.m. or 9 a.m., when the herring move down to a greater depth, they become increasingly active and the reaction of the fish to the electric light becomes acute.

Observations also lead to the conclusion that herring can only be caught in quantities during their vertical migration in the morning and the evening.

The Soviet Minister for Fisheries said that he believed that this venture was the first of its kind in relation to fishing. Its purpose was primarily for the solution of many problems connected with the fishing industry, such as the structure of shoals, the behavior of fish under different conditions--particularly during fishing operations; the observation of trawls and drift nets at various depths, with a view to their improvement; and extensive oceanographic readings. Other life in the sea was observed, such as jellyfish and plankton.

The Minister pointed out that while bathyspheres had their uses and were in fact already in operation, they were limited to vertical movement, were not adapted for long underwater submersion, and had to rely to a great degree upon chance as to whether anything of interest was seen. On the other hand, a submarine, such as the Severyanka, could actively penetrate the deep-sea world for a long period.

The <u>Severyanka</u> is equipped with underwater television for conducting researches directly ahead; echo-sounders operating upwards and downwards; instruments for taking exact measurements of the salinity, illumination, temperature, rate of flow, and the percentage of oxygen dissolved in the seawater. There are also devices for taking samples of the seabed and the surrounding water, apparatus for underwater filming and photographing, and close-range and long-range searchlights.

The instruments incorporate all the latest techniques in radio and electrical engineering making for compactness and efficiency. Some of the instruments are newly-devised for this submarine and have not hitherto been tried--such as the dissolved hydrogen recorder, a thermosaltmeter, the silt sampler, and the current recorders.

The $\underline{\text{Severyanka}}$ is to make several more research trips during $\underline{\text{1959}}$ (World Fishing, March 1959).



United Kingdom

FACTORYSHIP-TRAWLER "FAIRTRY II"

SAILS ON MAIDEN VOYAGE:
The British firm in Leith, Scotland, that owns the factory-ship-trawler Fairtry I, is adding two similar vessels to its fleet. Fairtry II, the first of the two new ones, sailed on its maiden voyage on April 2 from Glasgow.

Fairtry II, like its sistership, is equipped with stern trawling. The steep ramp up to the trawl deck from the waterline is less humped and less steep than on the <u>Fairtry I</u>, to reduce the drag when winching aboard a full trawl. The trawl is shot down this ramp, rollers and all, obviating the necessity for the manhandling that is required on a conventional side-trawler.

The full trawl is also brought up the ramp, using a 270 hp. electric trawl winch. The double cod end is lashed together once the trawl is up and then hoisted by the gantry to empty the fish on to the trawl deck; a hydraulically-operated gate closes the ramp entry to prevent fish from falling back into the sea. Once emptied on to the trawl deck, the fish are then transferred to the factory deck below through two chutes, one on each side of the deck, which can also be closed off by hydraulically-operated hatches.

From the trawl deck, the fish go into a number of pounds, built of corrugated alloy boards, and are hand-sorted for size and type. Anything other than the variety being fished for at the time is usually left in the pounds and iced up to a

wait the end of the run before being processed. Halibut, when caught, are headed and gutted by hand and hooked on to an overhead conveyor to go first to a blast freezer and then, still on their conveyor links, to a special subzero storage hold.

Since cod is the main catch, with pollock and ocean perch next, the production line is set up for it. Large fish are slit and the livers removed before being sent to the filleters. Medium and small fish are passed, untouched, along chutes to their respective filleting machines.

The sequence is as follows: Factory hand takes graded fish from chute, puts it into a heading machine. Another hand takes it off and puts it into the filleter; from there it goes to one of two skinners. At each stage, offal is automatically diverted down to the fish-meal and fish-oil plants on the deck beneath, which have a capacity of 10 tons of dried fish meal a day. The meal is immediately bagged and transferred to dry storage with a capacity of 300 tons. Liversfrom the big fish only, the smaller fish are not considered to be worth bothering about-go from the pounds into a macerator and then a two-stage digester and extractor; depending on the quantity available, the macerated livers can either pass through two extractors in succession or each extractor can be used separately.

Fillets eventually arrive at the weighing point. One operator takes them off as they arrive and weighs them into 7-pound, 14-pound, or 28-pound lots; the production is arranged so that he will not have to separate large from small fillets, which are not packed together, naturally. The scale is gimbal-mounted so as to remain level, whatever the motion of the vessel. He then packs them neatly into trays of their appropriate weights, first lining the tray with waxed paper and placing in it, upside down, a packing slip for process identification, grade, and type of fish.

When sufficient trays have been filled, they are loaded into one of the five plate freezers, each of which can freeze six tons of fillets in 24 hours. After freezing, the blocks are packed into fiberboard cases holding 56 pounds, wire-bound and then passed down a spiral conveyor into the cold-storage holds for stacking.

The ship is Diesel-electric powered by three five-cylinder engines each developing 1,340 hp., and each of which drives a directly-coupled generator developing 535 kw. at 400 v. In tandem with each main generator is a 270 kw. auxiliary gene-

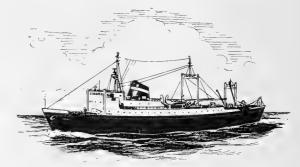


Fig. 1 - Fairtry II -- this is one of two new large factoryship stern trawlers constructed for a large British fishing company. The same company owns Fairtry I, and also the Fairtry III now under construction.

rator for the electrical supplies on board. The main driving motor, situated right aft, is a double armature machine rated at 2,000 s. hp., with a maximum speed of 130 r.p.m. and direct-coupled to the propeller shaft.

When the trawler is proceeding at its maximum speed, all three generators are required to supply the propulsion motor, but, on the fishing grounds, any one of the three main generators can be isolated and used to supply power to the trawlwinch motor. Thus sudden demands for extra power either for propulsion or for the trawl winch can be met, and the skipper could get increased power by bringing in an extra generator within 15 seconds.

Control of the engines is normally from the bridge, the engineroom taking over only in emergencies. Three telegraphs are provided, giving port and starboard positions on

United Kingdom (Contd.):

the bridge, and a starboard control position only on the boat deck aft to simplify manoeuvring when shooting or hauling the trawl. Operation of any one of the telegraphs causes the pointers of the other two to move to a corresponding position.

The refrigerating machinery is installed at the forward end of the engineroom. The two two-stage compressors deal with the refrigeration necessary for 30 tons of fish a day through the freezers and also maintain a temperature of $^{-10}$ ° F. in the storage holds.



Fig. 2 - Looking aft along the trawl deck of Fairtry II.

Trawl is winched up the ramp at the far end with the gate raised; the gate is lowered to prevent fish falling back and the trawl emptied on deck; the two chutes (one at each end of the bobbin storage racks) are opened and the fish are carried to the processing deck below.

Crew quarters are of a very high standard, consisting of four-berth cabins, with two-berth cabins for the higher ratings. Officers have single-berth cabins. There is an adequate supply of showers and a well-equipped galley to feed the crew on a cafeteria system, as well as an excellently-fitted recreation room.

Fairtry II is 235 feet over-all by 48 feet breadth-moulded; 25 feet depth-moulded to the main deck and 41 feet 6 inches depth to the bridge deck. With a crew, including factory personnel, of 96, she is able to stay at sea for 12 weeks without any difficulty; fuel oil capacity is 700 tons and a maximum consumption of 7 tons per day gives her plenty of margin.

* * * * *

GRANTS AND LOANS TO FISHING VESSELS TO MARCH 31, 1959:

Grants to the British inshore and near- and middle-water fishing fleets by the White Fish Authority (under the White Fish Act of 1953 and Herring Industries Act of 1957) as of March 31, 1959, amounted to about US\$17.3 million, and loans totaled about \$34.8 million.

Aberdeen, among the major fishing ports, has received the biggest share of grants and loans for conversions, new engines, and new construction since the start of the program.

Grants for construction since the beginning of the program in 1953 totaled \$16,624,000; for conversion of near- and middle-water vessels, \$210,000; and for the purchase of new engines, \$435,000. Loans for new vessels for the near- and middle-water fleets a mounted to \$33,100,000; for conversions the total was \$891,000; and for new engines, \$769,000.

Grants by the Herring Industries Board made to owners at the smaller ports since the passage of Herring Industries Act in 1957 totaled \$497,000 for construction of new vessels and \$127,000 for new engines. Loans to the herring fleets totaled \$671,000 for construction of new vessels and \$175,000 for engine replacements.

* * * * *

INTEREST RATE ON LOANS TO FISHING INDUSTRY REVISED:

The British White Fish Authority announced that, as a result of a recent change in the rates of interest charged to them by Treasury, their own rates of interest will be changed on loans as of March 31, 1959. The new rates are: on loans for more than five years, $4\frac{7}{8}$ percent; on loans for more than 10 years but not more than 15 years, $5\frac{1}{2}$ percent: and on loans for more than 15 years, $5\frac{7}{8}$, percent.

The new rates do not apply, however, where the final installment of a loan or interim installments in current cases were paid by the Authority before March 31, 1959.

The Authority's loans are connected with the building of new fishing vessels of not more than 140 feet; the purchase, in certain circumstances, of new engines and nets and gear for inshore vessels; the construction and equipment of processing plants; and the formation and development of cooperatives.

* * * * *

United Kingdom (Contd.):

MARINE OIL IMPORTS AND WHALE OIL PRODUCTION:

Imports of marine oils by the United Kingdom during 1958 decreased 9.0 percent as compared with 1957. Whale oil imports, the most important during both years, decreased 3.9 percent in 1958 as compared with 1957.

United Kingdom Imports of Marine Oils, 1957-1958				
Туре	1958	1957		
	(1,000 Long Tons)			
Vitamin A oil	0.3	0.4		
Sperm oil, unrefined	8.6	14.6		
Whale oil	136.4	141.9		
Others	1.8	4.8		
Total	147.1	161.7		

Britain's Antarctic whale oil production in 1958 was 49,900 long tons as compared with 58,100 in 1957. In addition, 6,700 tons were produced in the Falkland Islands (12,500 tons in 1957), the Foreign Agriculture Service of the U. S. Department of Agriculture reports in an April 17, 1959, dispatch from London.

In 1958, Britain used 80,000 long tons of whale oil in margarine and 47,000 tons in compound cooking fat as compared with 67,000 tons and 44,000 tons, respectively, in 1957.

Venezuela

FISH-PROCESSING INDUSTRY:

The canning plant at Cumana, Estado Sucre, Venezuela, has a complete shipto-can operation, fishing with boats built by the firm, importing United States tinplate, lithographing and producing cans, and packing sardines in tomato sauce, picante sauce, peanut oil, and in natural pack. Fish meal and fish oil are also produced.

The Cumaya plant employs approximately 480 workers at salaries of from Bs. 6.00 to Bs. 8.00 (US\$1.80 to \$2.40) a day. Canned fish production in the 1958 season totaled 217,000 cases of sardines (48-100 cans per case depending upon size of pack) and the pack for the present season is running at about the same level.

This firm produced 240,000 cans (round, square, rectangular) in 1957 and purchased the balance locally. It plans to enlarge its facilities for the production of cans and to produce a key-opened can.

The Cumana firm will soon be working with Japanese interests in fishing for and canning tuna.

The processing plant at Mariguitar, Estado Sucre, is a well-equipped plant and employs some 400 persons, including fishermen. Sardines are packed in a variety of styles similar to the Cumana plant; also produces fish meal and fish oil. The Margarita firm mixes its own picante sauce. Cans are purchased in Venezuela.

The fish processing plant located in Punta Piedras, Isla Margarita, is a small operation, employing some 80 persons, mostly women. In the past it packed sardines, tuna, and shark products. Production over the past 5 years has averaged 17,000 cases of sardines, 198 tons of freshfish, and 12 tons of sharkliver oil annually. This plant is seeking aid from the Venezuelan Development Corporation. At present, however, the Punta Piedras plant is concentrating on pepetones, the small local clams.

The labor forces in Venezuelan canneries are about 85 percent female with male supervisors, mechanics, and a few additional men to do the heavy work. On the whole, working conditions, wages, other benefits, and training programs are far below United States standards. Most Venezuelan canneries have local unions but there is a gradual movement towards an industry-wide organization. The major plants are working with signed union contracts and salaries are standard throughout the industry.

The plant at Cumana most closely approaches American standards for working conditions. Its employees are uniformed, work in clean surroundings, have an attendant on hand to administer first-aid, and maintain a high standard of personal cleanliness. This plant also provides a daily noon meal (consisting of soup, a vegetable, meat, a sweet, and

Venezuela (Contd.):

milk) for its employees. The only thing approximating a training program was also found in this plant where an employee serves as apprentice to an experienced worker before taking on any position on his own.

Five Venezuelan firms are now producing fish meal. These plants, all in the state of Sucre in eastern Venezuela, are located in Cumana, El Barbudo, Caiguire, and Mariguitar.

The quantity of fish meal produced in Venezuela is uncertain as local estimates vary. In 1957 one Government source reported 1,480 metric tons and a second Government source, 2,110 tons.

The second Government source reported 2,120 tons produced in 1958.

The Venezuelan Development Corporation, using figures from the second Government source, estimates that Venezuela is now 48.5 percent self-sufficient in fish meal. The nation's principal consumer is Venezuela's largest producer of animal feedstuffs.

Fish oil is produced in Venezuela only by two plants located at Cumana and Margarita. Another at La Guaira is expected to be producing fish meal and oil in the near future, the United States Embassy at Caracas reported on March 18, 1959.

Note: Also see Commercial Fisheries Review, May 1959, p. 81.



OCEANOGRAPHERS MAKE NEW PRECISE GEOLOGICAL TIME CLOCK

Oceanographers have succeeded in extending back in time the precise date of glacial events to well over 100,000 years. Paradoxically, this new information regarding the age of land glaciers is based upon investigations of deep-sea sediments taken far from land and two miles below the ocean surface.

More and more, science is turning to the ocean to find the answers to the problems of the earth's history. Geologists of the U. S. Geological Survey and of the University of Miami based their findings upon fine sediments which cover the floor of the Caribbean Sea. By measurements of radioactive thorium and protoactinium in these sediments it has been possible to place the age of the last interglacial period at almost exactly 100,000 years ago, thus confirming theoretical estimates previously made. These samples were obtained by deep-sea cores taken from the central Caribbean by the Woods Hole Oceanographic Institution research vessel Atlantis, by means of a device which drives a tube into the seafloor. Since sediments accumulate at the rate of about 1 inch in 1,000 years, a core-sampling tube penetrating beneath the sea floor may easily reach sediments of 100,000 years or more.

The radioactive content of the sediments provides a means of dating these samples. Other measurements made from the sample give the temperature of the sea at the time the sediments was deposited, thus linking it to the various glacial and interglacial periods of land, which influence the sea temperatures.



Department of Commerce

BUREAU OF THE CENSUS

IMPORTED COMMODITY CLASSIFICATION CHANGES BEING CONSIDERED:

Consideration is now being given to making a limited number of changes in the present import commodity classifications (Schedule A) effective with the January 1960 statistics, according to the Bureau of the Census, U. S. Department of Commerce.

In addition to the commodity classification changes, it is also planned to prepare and release a publication for use by importers and their agents presenting the statistical commodity classifications in tariff classification arrangement. This publication (i.e., reporting manual for United States importers) would assist importers in determining the proper statistical classifications applicable to any importation and should serve to improve the accuracy of the reporting and as a result also improve the accuracy of the published import statistics.

It bears emphasizing that to carry out the work outlined above, changes in Schedule A to be effective January 1960 must be kept to a minimum. Only part (and perhaps only a small part) of the requests for changes can be made effective January 1960. However, it appears appropriate to make such changes, even though there may be difficulties in selecting those which are most urgent, since if this is not done, all requests for changes must await a full revision of Schedule A which may not take place for two or three years.



Federal Trade Commission

CONSENT ORDER PROHIBITS SHRIMP COMPANY FROM PAYING ILLEGAL BROKERAGE:

The Federal Trade Commission on May 25, 1959, ordered (Consent Order 7274, Shrimp) a New Orleans, La., shrimp company to stop paying illegal brokerage to its customers.

This action represents the adoption by the Commission of an initial decision by Hearing Examiner William L. Pack based on an order agreed to both by the company and the Commission's Bureau of Litigation.

The Commission's complaint, issued October 8, 1958, charged that 60 percent of the company's sales are not handled through brokers, but these direct purchasers are given allowances approximating the normal brokerage fee or price reductions reflecting this brokerage. These arrangements are forbidden by Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act, the complaint alleged.

The company's agreement to discontinue these payments is for settlement purposes only and does not constitute an admission that it has violated the law.



Department of the Interior

FISH AND WILDLIFE SERVICE

ALASKA BRISTOL BAY LIMITED COM-MERCIAL SALMON FISHING REGULATIONS FOR 1959 ISSUED:

A limited commercial fishery for red salmon in Bristol Bay, Alaska, this year

was announced on May 25 by the Secretary of the Interior. Alaska commercial fisheries regulations previously published had closed Bristol Bay to commercial fishing for red salmon in order to insure necessary escapement of spawning fish. In announcing the regulations on April 24, the Secretary said further changes might be forthcoming in light of subsequent developments.

The Secretary said that he had authorized the change in the regulations



after a thorough review of the situation in the light of recent developments, including discussions with the Japanese regarding the high-seas salmon fishery.

The new regulation will permit limited commercial fishing for red salmon in each of the major districts of Bristol Bay. Both drift nets and set nets will be permitted to operate for weekly fishing periods determined on the basis of the amount of fishing gear registered for fishing.

The regulation provides for a fishery of a type similar to recent years, but on a much more restricted basis. The so-called "gear-time table" will be utilized to regulate the fishery. However, shorter weekly fishing periods will be allowed at a given level of fishing effort than in previous years. No change is made in the regulations previously promulgated for species other than red salmon.

The Secretary has been informed by the Bureau of Commercial Fisheries that the high-seas fishery in the North Pacific will be less intense generally than last year. He has also been informed that the total quota of the Japanese fishery has been reduced this year and that with respect to red salmon-the species of particular concern in Bristol Bay-the Japanese quota throughout the area of the North Pacific in which Japanese fish-

ermen operate has been reduced from 11 million fish last year to 8 million fish this year.

In the areas frequented by North American red salmon stocks, it is expected that catches will not be sufficiently great to preclude a limited commercial fishery in Bristol Bay on these same stocks in the course of their migration to the spawning grounds. Secretary Seaton emphasized, however, that developments during the fishing season for red salmon on the high seas and in Bristol Bay will be watched very closely, and that further changes in regulations may be necessary to assure the adequate seeding of the spawning grounds to preserve the resource.

Alaska commercial fisheries regulations were revised and issued on March 7, 1959, and published in the Federal Register of March 19, 1959. For Bristol Bay salmon fishing, the revised regulations merely defined salmon fishing districts and prescribed limitations on personal use fishing with nets. A footnote explained that the issuance of the commercial salmon fishery regulations for 1959 in the Bristol Bay Area were being delayed pending clarification of the high-seas fishery situation.

On April 24, the Secretary of the Interior prescribed salmon fishery regulations for the Bristol Bay area (effective May 28, 1959), which imposed a drastic curtailment of red salmon fishing in that area in the light of an expected small cycle run of red salmon in 1959 and the prospect of an intense high-seas fishery on these same stocks of fish.

After a thorough review of the situation in the light of recent developments, including discussions with the Japanese Government, regarding the high-seas salmon fishery, it was decided to authorize a very limited commercial fishery involving all districts of the Bristol Bay area. In the areas of the North Pacific frequented by North American redsalmon stocks, it is expected that catches will not be sufficiently great to preclude a limited commercial fishery in Bristol Bay, Alaska, on these same stocks in the course of their migration to the spawning grounds. Thus, the May 30 Federal Register contained amendments to Part

104 of the Alaska Commercial Fisheries regulations which will permit limited commercial fishing for red salmon in each of the major districts of Bristol Bay. As amended, salmon fishing, except trolling, in the Bristol Bay area is prohibited in all districts prior to June 1 and after August 31, 1959.

The pertinent part of the regulations as they appeared in the Federal Register follow:

§104.9 (Amendment)

- 3. Paragraph (a) of \$104.9 is amended to read as follows:
- (a) During the period June 22 to July 25, the statutory weekly closed period of 36 hours is extended so as to limit fishing to the number of days per week set out in the following table, wherein the number of days of fishing is governed by the total number of units of gear registered for fishing in the respective districts as of 6 p.m. of the Friday immediately preceding the week in which fishing is permitted.

Units of Gear by District					
Naknek- Kvichak	Nushag a k	Egogik	Ugashik	Day of Fishing Per Week	
Over 150	Over 324 227-324	Over 60	Over 50	1.0	
103-150	195-226	49-60	38-50	2.5	
79-102	162-194	43-48	31-37	3.0	
65-, 78	130-161	39-42	27 - 30	3.5	
55- 64	113-129	37-38	25-26	4.0	
54	112	36	24	5.0	

- 4. Paragraph (c) of \$104.9 is amended to read as follows:
- (c) Announcement of the total number of registrations for each district will be made locally within 18 hours after the close of registration and by publication in the Federal Register.

Note: Also see <u>Commercial Fisheries Review</u>, June 1959, p. 87.

* * * * *

REGULATIONS AMENDED TO PERMIT DRIFT-NET AND PURSE-SEINE SALMON FISHING ON ALTERNATE DAYS IN BEAR RIVER SECTION:

Purse seines and drift nets can now be used to fish for salmon on alternate days in the Bear River Section of Alaska. This change was published as an amendment to the Alaska Commercial Fisheries Regulations in the June 9 Federal Register. The pertinent part of the amendment to the regulations follows:

Among the proposals submitted by various segments of the fishing industry in response to the notice of proposed rule

making on 1959 Alaska commercial fisheries regulations was one which advocated a change in the regulations applicable to the Bear River Section, North Central District, Alaska Peninsula Area (Part 105), to accomplish a more equitable distribution of the allowable salmon catch among purse-seine fishermen and drift-net fishermen who compete with one another in the local fishery. No change in the prior existing regulations for this area was effected in the revision of the Subchapter adopted on March 7, 1959, principally because the dispute arose from organizational factors and from intense competition between two forms of fishing gear.

Subsequent to the adoption of the revision published on March 19, 1959, representatives of the operators of the two competing forms of fishing gear resolved their differences and urged that further controversy be avoided during the 1959 season by amending the regulations for the Bear River Section to allow purse seines and drift nets to fish on alternate days on either side of a line dividing the area in controversy. Since management and conservation of the resource will be benefited by forestalling further increases in fishing effort which otherwise almost certainly would occur in this small section, it has been determined to be in the public interest to amend the regulations accordingly.

Paragraph (b) of § 105.5 is amended to read as follows:

- (b) NORTH CENTRAL DISTRICT. (1) Prior to June 21, fishing is permitted in all sections with gill nets having a mesh size of not less than 8-1/2 inches stretched measure.
- (2) Nelson Lagoon section and General section, from 6 a.m. June 22 to noon September 30.
- (3) In the Bear River section (i) purse seines and gill nets may be used throughout the section from 6 a.m. June 22 to 6 p.m. June 25 and from 6 a.m. July 22 to noon September 30; (ii) on June 29 and July 1, 7, 9, 13, 15, and 21, only purse seines may be used northeast of the church located near the beach about two miles northeast of the mouth of Bear River, and only drift nets may be used southwest of the church; and (iii) on June 30 and July 2, 6, 8, 14, 16, and 20, only drift nets may be used northeast of the church and only purse seines may be used southwest of the church.



White House

NATIONAL SAFE BOATING WEEK, JUNE 28-JULY 4:

A Presidential proclamation designated the week of June 28, 1959, "National Safe Boating Week," affording an opportunity to stress vessel safety.

In part, the proclamation read:

"NOW, THEREFORE, I DWIGHT D. EISENHOWER, President of the United States of America, do hereby designate the week beginning June 28, 1959, as National Safe Boating Week.

"I urge all boatmen, boating organizations, the boating industry, State and Federal agencies, and all other groups interested in boating to join in this observance of National Safe Boating Week; and I call upon them to exert greater effort during that week and throughout the boating season to keep boating safe and pleasant.

"I also invite the Governors of the States, the Territory of Hawaii, the Commonwealth of Puerto Rico, and the possessions of the United States to provide for the observance of this week to encourage nationwide interest in safe boating practices..."

* * * * *

PRESIDENT SIGNS PACIFIC HALIBUT FISHERY REGULATIONS:

The 1959 proposed regulations of the International Pacific Halibut Commission were adopted and signed by the President on March 31, 1959. The regulations were published in the April 16 Federal Register.

Note: Also see Commercial Fisheries Review, April 1, 1959, p. 60.



Eighty-Sixth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the



fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate,

as well as signature into law or other final disposition are covered.

ALASKA OMNIBUS ACT: The House on June 1 passed H. R. 7120, to amend certain laws of the United States in light of the admission of the State of Alaska into the Union. In addition to a series of clarifying amendments the House adopted an amendment limiting the transfer of Federal property in connection with the transfer of functions to this act and the act of July 7, 1958 (P. L. 85-508).

The Senate Committee on Interior and Insular Affairs on May 28 ordered favorably reported with amendments S. 1541 and S. Rept. No. 331.

Senate Report No. 331, Alaska Omnibus Bill (May 28, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interior and Insular Affairs together with individual views to accompany S. 1541), 60 pp., printed. The report contains major provisions of the bill, committee amendments,

sectional analysis of the bill, Executive Agency reports, and changes in existing law. The appendix contains Legislative Precedents for Grants of Federal Property to Newly Admitted States of the Union.

The Senate on June 3 passed with amendment H. R. 7120. The amendment substituted the amended text of S. 1541, companion bill, which had first been amended by adoption of two technical amendments of clarifying nature and a further amendment which provided for transfer without reimbursement, of any real or personal propertylocated in Alaska and owned by the United States. Action on S. 1541 was postponed indefinitely since H. R. 7120 was passed instead by the Senate. The Senate requested the concurrence of the House for its amendments to H. R. 7120.

The House on June 11 agreed to Senate amendments, with an amendment, to <u>H. R. 7120</u>, and sent the bill back to the Senate requesting concurrence of the Senate in the amendment.

The Senate on June 12 concurred in a technical House amendment to H. R. 7210, this action cleared the bill for the President's signature. The legislation is largely technical providing changes in Federal laws, necessary because of the change in Alaska's status from Territory to a State, eliminating inappropriate references in Federal statutes. Other provisions are substantive, terminating certain special Federal programs in Alaska, and enabling participation by Alaska in other programs on "an equal footing with other States." The bill was drafted by the executive agencies concerned with the administration of Federal responsibilities in Alaska. Two provisions are of particular interest to fisheries interests: (1) Alaska will assume jurisdiction over its fish and wildlife resources the first day of the calendar year following expiration of 90 calendar days instead of 90 legislative days after certification by the Secretary of the Interior that the Alaska State Legislature has made "adequate provision for the administration, management, and conservation of the fish and wildlife resources of Alaska in the broad national interest." (The Secretary of the Interior made the certification on April 20. The transfer, therefore, will be effective January 1, 1960, unless Congress adjourns before the 90 days provided in the bill.) (2) authorizes the President to transfer to Alaska without reimbursement property used in a function taken over in whole or part by the State.

Alaska Omnibus Bill (Hearings before the Subcommittee on Territorial and Insular Affairs of the Committee on Interior and Insular Affairs, United States House of Representatives, 86th Congress, 1st Session, on H. R. 6091, H. R. 6109, and H. R. 6112, to amend certain laws of the United States in light of the Admission of the State of Alaska into the Union, and for other purposes, May 4 and 5, 1959), 82 pp., printed.

Alaska Omnibus Bill (Hearing before the Committee on Interior and Insular Affairs, United States Senate, 86th Congress, 1st Session, on S. 1541, a bill to amend certain laws of the United States in light of the Admission of the State of Alaska into the Union, and for other purposes, May 7, 1959), 82 pp., printed.

These reports contain a detailed analysis of the legislation and statements presented before the committees by representatives of State and Federal Agencies.

COLUMBIA RIVER FISHERIES INVESTIGATION: H. Con. Res. 192 (Ullman), a concurrent resolution to make an investigation concerning anadromous fish in the Columbia River Basin; to the Committee on Merchant Marine and Fisheries; introduced in House June 2.

FISHERIES ASSISTANCE ACT OF 1959: H. R. 7505 (McDowell), a bill to provide a program of assistance to correct inequities in the construction of fishing vessels, to enable the fishing industry of the United States to regain a favorable economic status, to provide disaster relief to the oyster industry which has been almost completely destroyed in some areas of the United States, and for other purposes; to the Committee on Merchant Marine and Fisheries; introduced in House June 2. The bill contains certain provisions similar to those provided for in H. R. 181 and related bills previously introduced. Similar to H. R. 181 and related bills previously introduced which would provide assistance to depressed segments of the fishing industry. But, in addition, H. R. 7505 would extend disaster loan provisions to include oyster producers and processors within segments of the fishing industry found to be in a distressed condition, or located in a disaster area. Such loans would be made for the improvement and modernization of plants, and for the relief of distressed conditions caused by blight or other catastrophe, and upon terms of not more than 20 years and at interest rates of not less than 3 percent. The bill further provides that when 60 percent or more of the oysters in any waters within the United States have been destroyed by blight or other catastrophe, such area shall be held to have been declared an area of major disaster under this Act.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held public hearings June 4 and 11 on H. R. 181, and related bills, which would provide assistance to depressed segments of the fishing industry. Testimony was heard from Representative McDowell on the proposed legislation.

The Subcommittee on June 15 met in executive consideration of, but took no action on $\underline{H}.~\underline{R}.~\underline{181}$ and related bills, providing a 5-year program of assistance to enable depressed segments of the fishing industry in the United States to regain a favorable economic status.

FISH HATCHERY TRANSFER: S. 2053 (Johnston of South Carolina and Thurmond), a bill to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; also H. R. 7386 (Riley), an identical bill; both introduced on May 26; Senate bill referred to the Committee on Interstate and Foreign Commerce, House bill to the Committee on Merchant Marine and Fisheries. Provides authority for the Secretary of the Interior to accept by donation on behalf of the United States, title to the Orangeburg County, South Carolina, fish hatchery, together with rights to take adequate water from Orangeburg County Lake therefor.

FISHERIES PRODUCTS INCLUDED IN FOOD-ALLOTMENT PROGRAM: The Subcommittee on Agricultural Production, Marketing, and Stabilization of Prices of the Senate Committee on Agriculture and Forestry held hearings June 4, 5, and 8 on S. 585, and related bills S. 489, S. 663, S. 862, and S. 1884, dealing with the subject of food distribution programs. S. 585 would provide that the program of commodity distribution be expanded to include fishery products and certain other foods among items available for distribution to needy families so as to assure an adequate diet, reduce certain surpluses, and for other purposes.

FISH AND WILDLIFE AID THROUGH EQUIP-MENT TRANSFER: S. 2103 (Bible), a bill to provide that surplus personal property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; introduced in Senate June 2; also H. R. 7535 (McIntire) introduced in House June 2, H. R. 7580 (Fulton) introduced in House June 3, and H. R. 7584 (Baring) introduced in House June 5; referred to respective Senate and House Committee on Government Operations. Similar to H. R. 7190 previously introduced. Provides change in existing laws to include State Fish and Game Departments among State agencies eligible for receipt by transfer of surplus Federal Government Property and equipment for use in furthering their fish and wildlife conservation, restoration, and educational objectives.

IMPORTATION OF POLLUTED SHELLFISH PROHIBITED: S. 2112 (Jackson & 7 other Senators), a bill to prohibit the importation into the United States of polluted shellfish; to the Committee on Finance; introduced in Senate June 4. Similar to H. R. 1244 and related bills previously introduced.

INTERIOR DEPARTMENT APPROPRIATIONS: The Subcommittee of the Senate Committee on Appropriations on June 2, in executive session, marked up and ordered favorably reported to the full committee with amendments H. R. 5915, fiscal 1960 appropriations for the Department of the Interior and related agencies. Included are funds for the Fish and Wildlife Service and its two Bureaus.

Interior Department and Related Agencies Appropriations for 1960 (Hearings before a Subcommittee on Appropriations, United States Senate, 86th Congress, 1st Session, on H. R. 5915, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1960, and for other purposes), 1109 pp., printed. Contains budget estimates, House allowances, and testimony presented by witnesses and representatives of the Department of the Interior and Related Agencies in connection with appropriations for Fiscal Year 1960. Included are funds for the Fish and Wildlife Service and its two Bureaus.

The Senate Committee on Appropriations, in executive session, on June 5 ordered favorably reported with amendments H. R. 5915 (S. Rept. No. 345). As approved, the bill would provide the Department a total of \$478,785,025, an increase of \$10,678,225 over the House-passed figure of \$468,106,800.

Senate Report No. 345, Interior Department and Related Agencies Appropriation Bill, 1960 (June 5, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Appropriations to accompany H. R. 5915), 39 pp., printed. Lists by agencies appropriations for the 1959 fiscal, including funds provided for salary cost increases in the Second Supplemental Appropriations Act, 1959, Public Law 86-30; the Budget estimates, 1960; House allowance; and Committee recommendation. Included are funds for the Fish and Wildlife Service and its two Bureaus.

By unanimous vote, the Senate on June 8 passed with amendments H. R. 5915. The Senate insisted on its amendments, asked for a conference with the House, and appointed conferees. As passed by the Senate the Bureau of Sport Fisheries and Wildlife is allowed \$14,693,625, an increase of \$1,385,625 over the amount allowed by the House. The Bureau of Commercial Fisheries is allowed \$6,906,300, an increase of \$978,300 over the funds allowed by the House and \$694,700 less than the budget estimate--Administration of Alaska Fisheries was allowed \$1 million; Senate recommended restoration of House cut of \$378,000 for marketing, technology and research activities; also allowed \$50,000 for fish vessel mortgage insurance program, \$3 million for fisheries loan fund, \$325,000 for general administrative expenses, \$345,000 for construction (of which \$185,000 is for salt-water system for Galveston biological laboratory, \$25,000 for laboratory building at Karluk, Alaska, \$35,000 for Pascagoula dock repairs); and allowed an increase of \$100,000 for plans for a new vessel to replace research vessel Albatross III. For the Office of the Commissioner of Fish and Wildlife Service the Senate allowed \$340,000.

The House disagreed to Senate amendments to H. R. 5915; agreed to a conference requested by the Senate; and on June 11 appointed conferees.

Senate and House Conferees, in executive session on June 11, agreed to file a conference report on the differences between Senate- and House-passed versions of H. R. 5915.

House Report No. 545, Department of Interior and Related Agencies Appropriation Bill, 1960 (June 12, 1959, 86th Congress, 1st Session, Report of the Joint Senate and House Committee of Conference to accompany H. R. 5915), 9 pp., printed. Contains committee recommendations to House and Senate on the disagreeing votes of the two Houses on the amendments of the Senate to bill (H. R. 5915), making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1960, and for other purposes. Included are funds for the Fish and Wildlife Service and its two Bureaus. For the Office of the Commissioner of Fish and Wildlife Service, the Joint Committee allowed for salaries and expenses \$340,000, the same as provided by the House and Senate but \$3,000 under the budget estimate. For the Bureau of Sport Fisheries and Wildlife, the Committee allowed \$17,561,200 -- an increase of \$853,200 over the amount originally provided by the House, but \$1,173,625 under the amount provided by the Senate and \$69,000 under the amount requested in the budget estimate. For the Bureau of Commercial Fisheries, the Committee allowed \$10,015,000 -- an increase of \$517,000 over the amount provided by the

House, but \$741,300 under the amount provided by the Senate, and \$1,156,200 under budget estimates.

The House and Senate on June 15 adopted conference report on and cleared for the President H. R. 5915, fiscal 1960 appropriations for the Department of the Interior, and related agencies.

POWER PROJECTS FISHERIES RESOURCES PROTECTION: Amendments to S. 1420 (Neuberger), a bill to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act; to the Committee on Interstate and Foreign Commerce; introduced in Senate June 3. Provides technical amendments to S. 1420 (Neuberger) introduced in Senate March 16, 1959; bill provides the Fish and Wildlife Service with collateral jurisdiction in Federal Power Commission decisions affecting hydroelectric power development in areas where dams would impair migratory fisheries resources and wildlife values.

PRICE DISCRIMINATION ENFORCEMENT OF ORDERS: The Antitrust Subcommittee of the House Committee on the Judiciary held hearings on May 27-28 and ordered favorably reported H. R. 432, and related bills, to amend section 11 of the Clayton Act to provide for the more expeditious enforcement of cease-desist orders issued thereunder.

PROTECTION OF FISHING RIGHTS RELATIVE TO MILITARY CLOSURES: A joint resolution of the Legislative Assembly of the State of California was presented to the House on May 28. The Memorial urges that the Congress of the United States and the Secretary of Defense be requested to take all steps necessary to insure that prior to the closure of any area to fishermen by the military authorities, that a public hearing be held in the area affected, except when such closing is a matter of extreme urgency, and that all such closures be limited to those areas and times when such closing is vital to our national defense with reasons for such closing being made public whenever compatible with security restrictions; referred to the Committee on Public Works.

PUERTO RICO AND UNITED STATES COM-PACT AMENDMENTS: The Senate Committee on Interior and Insular Affairs held hearings June 9 on S. 2023, to provide for amendments to the compact between the people of Puerto Rico and the U. S. with testimony favoring its enactment from Governor and Resident Commissioner of the Commonwealth. Hearings were recessed subject to call of the Chair. The proposed amendments are largely technical in order to eliminate inappropriate provisions, and to clarify, develop, and perfect the terms of existing law so as to achieve better fulfillment of purposes and strengthen the compact.

SHRIMP CONSERVATION CONVENTION WITH CUBA: The Senate on June 4 unanimously voted to adopt resolution providing for ratification of convention between the United States and Cuba for the conservation of shrimp, signed at Havana on August 15,1958 (Ex. B, 86th Congress, 1st session). It will remain in force for 10 years and thereafter until terminated on one year's notice by either party. Instruments of ratification will be exchanged between the United States and Cuba and a meeting

will be held soon to organize the Commission and draft legislation drawn up to submit to Congress and \$100,000 budget to finance for first year.

SHIP MORTGAGE INSURANCE AMENDMENT OF 1959: The Subcommittee on Merchant Marine of the House Committee on Merchant Marine and Fisheries on June 5 ordered favorably reported to the full committee S. 1434, to amend title XI of the Merchant Marine Act, 1936, as amended, with respect to insurance of ship mortgages.

SMALL BUSINESS ACT OF 1938 AMENDMENTS: A draft of proposed legislation to amend The Small Business Investment Act of 1938, and for other purposes (with accompanying papers) was transmitted to the Senate and House by the Administrator of the Small Business Administration; referred to the respective Senate and House Committee on Banking and Currency on June 3.

The Senate Select Committee on Small Business on June 3 held hearings for the purpose of reviewing the activities and programs of the Small Business Administration, with especial emphasis on the operation of the Small Business Investment Act.

STARFISH ERADICATION IN LONG ISLAND SOUND: The Subcommittee on Fisheries and Wild-life Conservation of the House Committee on Merchant Marine and Fisheries on June 3 conducted hearings on H. R. 3087 and related bills to eradicate starfish in Long Island Sound and adjacent waters. Witnesses heard were Representatives Wainwright and Giaimo.

STATE DEPARTMENT APPROPRIATIONS: Department of State and Justice, the Judiciary, and Related Agencies Appropriations for 1960 (hearings before the Subcommittee on Appropriations for the Department of State, United States House of Representatives, 86th Congress, 1st Session), 1126 pp., printed. Contains budget estimates and testimony presented by witnesses and representatives of the Department of State and related agencies in connection with appropriations for fiscal year 1960. Included are funds for the international fisheries commissions to enable the United States to meet its obligations in connection with participation in eight such commissions pursuant to treaties or conventions, and implementing Acts of Congress.

H. R. 7343 (Rooney), a bill making appropriations for the Departments of State and Justice, the Judiciary, and related agencies for the fiscal year ending June 30, 1960, and for other purposes; referred to the Committee on Appropriations; introduced in House May 21. Included are funds for the international fisheries commissions.

House Report No. 376, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1960 (May 21, 1959, 86th Congress, 1st Session, Report of the House Committee on Appropriations to accompany H. R. 7343), 28 pp., printed. Contains budget estimates

and amounts recommended by the Committee in comparison with the 1959 appropriations. Committee recommended \$1,725,000-an increase of \$61,300 over the 1959 fiscal year appropriations to meet increased pay costs, but \$29,000 below the amount of the budget request--for the international fisheries commissions.

The House on May 27 passed <u>H. R.7343</u>, Departments of State and Justice, the <u>Judiciary</u>, and Related Agencies Appropriation Bill, Fiscal Year 1960; referred to the Senate Committee on Appropriations on May 28.

The Subcommittee of the Senate Appropriations Committee conducted hearings June 8, 9, 10, 11, and on June 12 concluded hearings on H. R. 7343.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: H. J. Res. 411 (Slack), a House joint resolution to provide for a special research inquiry into the causes of chronic unemployment in economically depressed areas, and for other purposes; to the Committee on Government Operations; introduced in House June 3.

UNEMPLOYMENT TAX PROVISIONS FOR CERTAIN FISHING ACTIVITIES: S. 2125 (Eastland), a bill to provide that the tax imposed by the Federal Unemployment Tax shall not apply with respect to service performed by individuals in connection with certain fishing and related activities; to the Committee on Finance; introduced in Senate June 5. The bill would amend paragraph (17) of section 3306 (c) of the Internal Revenue Code of 1954 (relating to the definition of "employment" for purposes of the Federal Unemployment Tax Act). Provides that unemployment tax shall not apply with respect to service performed by an individual in (or as an officer or member of the crew of a vessel while it is engaged in) the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life (including service performed by any such individual as an ordinary incident to any such activity), except service performed in connection with the catching or taking of halibut or salmon for commercial purposes.

WAGES: H. R. 7490 (Frelinghuysen), a bill to amend the Fair Labor Standards Act of 1938, as amended; to the Committee on Education and Labor; introduced in House June 2. Identical to S. 1967 previously introduced which would extend coverage under the Fair Labor Standards Act, and for other purposes. The proposed amendments would not change the present status of employees employed in executive, administrative, professional, or outside sales capacities. Exemptions would remain unchanged for fishermen; for agricultural and irrigation workers, learners, apprentices, messengers, and handicapped workers; for workers on agricultural commodities in the area of production; for seamen on foreign vessels; and for newsboys.

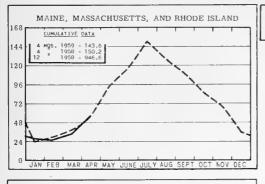


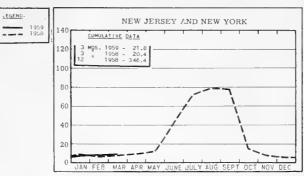


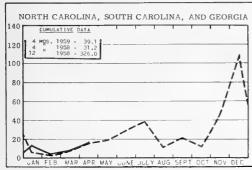
CHART I - FISHERY LANDINGS for SELECTED STATES

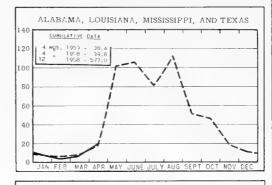
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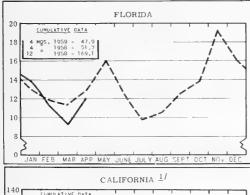
In Millions of Pounds

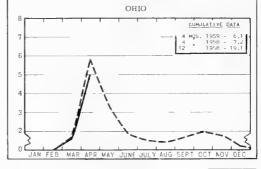


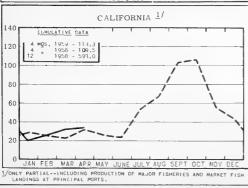


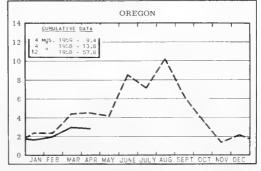


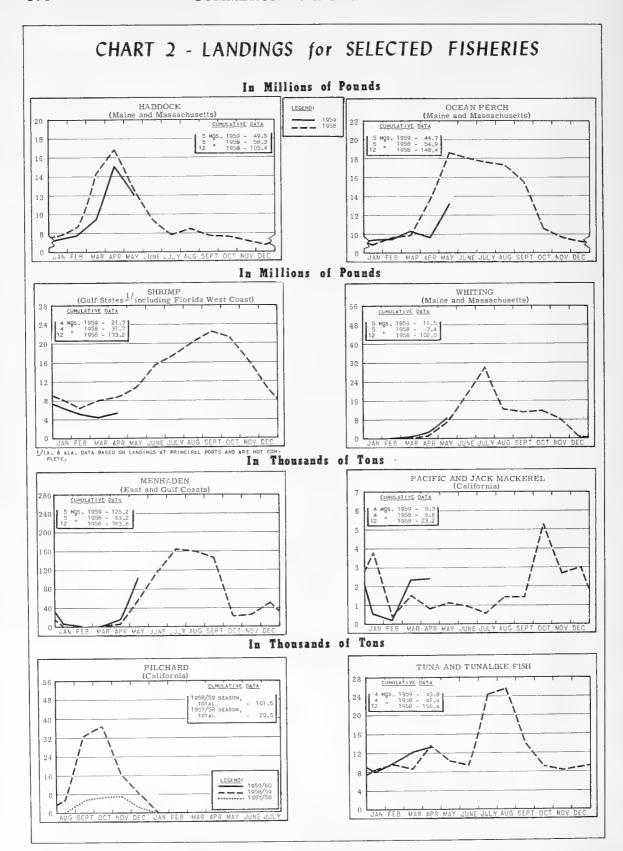


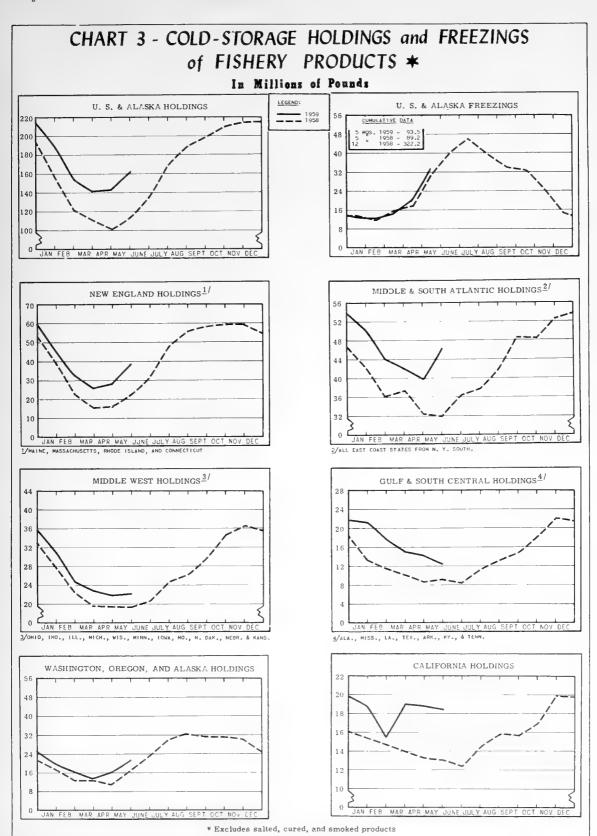


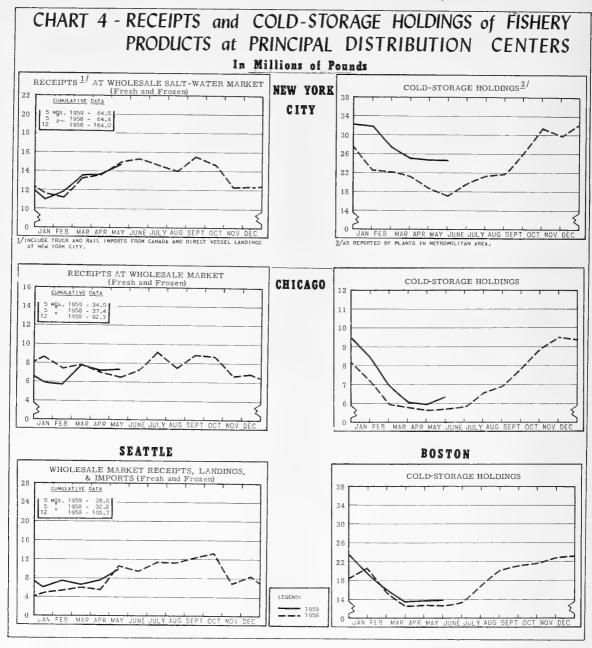












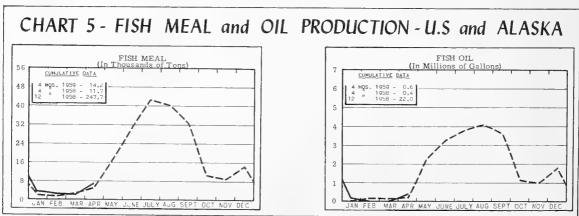
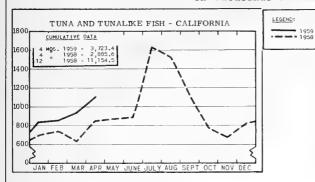
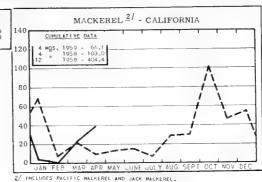
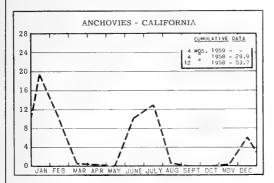


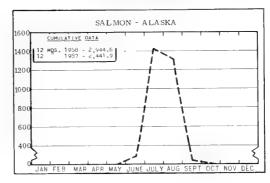
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



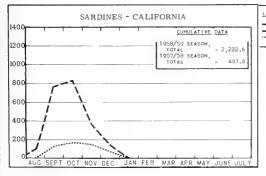


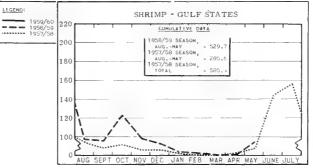


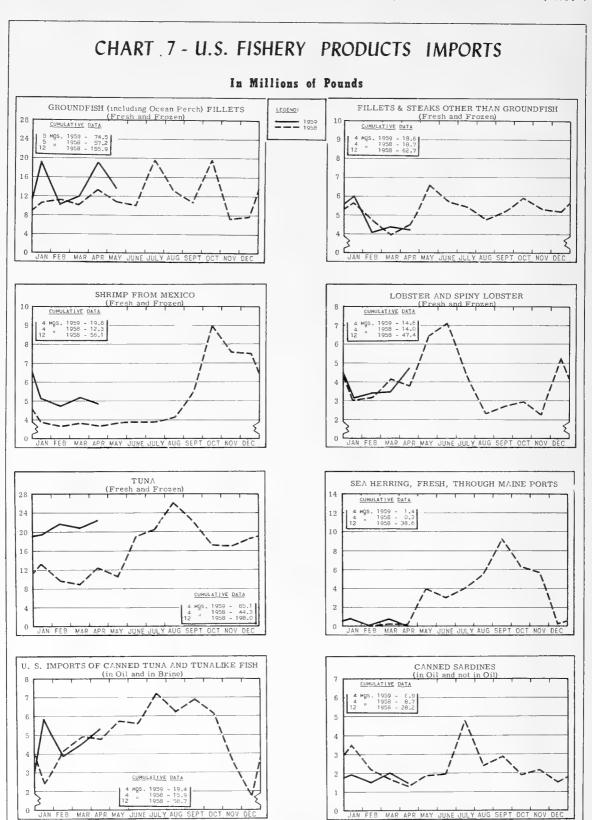


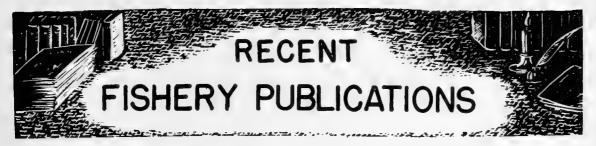
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<u>s</u>	TANDARD (CASES	
Variety	No. Cans	Designation	n Net Wgt.
SARDINES	100	drawn	$3\frac{3}{4}$ oz.
SHRIMP	48		5 oz.
TUNA	48	# ½ tuna	6 & 7 oz.
PILCHARDS	48	# 1 oval	15 oz.
SALMON	48	1-lb. tall	16 oz.
ANCHOVIES	48	½-1b.	8 oz.









FISH AND WILDLIFE SERVICE **PUBLICATIONS**

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIG-NATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.

AND ALASMA:
- FISHERY LEAFLETS.
- STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BY PRODUCTS.

SSR.- FISH. SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Title Number

CFS-2007 - Mississippi Landings, January 1959, 2 pp.

CFS-2008 - New York Landings, January 1959, 4 pp.

CFS-2011 - Massachusetts Landings, November 1958, 5 pp.

CFS-2012 - New Jersey Landings, February 1959, 3 pp.

CFS-2017 - South Carolina Landings, February 1959, 2 pp.

CFS-2018 - Fish Meal and Oil, February 1959, 2 pp.

CFS-2019 - Massachusetts Landings, December 1958, 5 pp.

CFS-2022 - Maine Landings, February 1959, 3 pp. CFS-2023 - California Landings, November 1958, 4 pp.

CFS-2025 - Shrimp Landings, November 1958, 6 pp.

CFS-2026 - Florida Landings, February 1959, 7 pp.

CFS-2028 - Texas Landings, January 1959, 3 pp. CFS-2029 - Georgia Landings, February 1959,

2 pp. CFS-2030 - Rhode Island Landings, November 1958, 3 pp.

CFS-2031 - Maine Landings, 1958 Annual Summary, by County and Gear, 10 pp.

CFS-2032 - Maine Landings, 1958 Annual Summary, by Months, 5 pp.

CFS-2033 - New York Landings, February 1959, 4 pp.

CFS-2034 - Frozen Fish Report, March 1959, 8 pp.

CFS-2039 - Rhode Island Landings, December 1958, 3 pp.

CFS-2044 - Alabama Landings, January 1959, 2 pp. CFS-2048 - Florida Landings, March 1959, 7 pp.

CFS-2055 - Mississippi Landings, February 1959, 2 pp.

FL-451 - The Striped Bass, by Edward C. Raney, 6 pp., illus., revised May 1958. (Revision of FL-175, March 1946.)

FL-469 - Seaweeds and Their Uses, by F. Bruce Sanford, 25 pp., November 1958. "Seaweeds are mis-named," states the author, "for they are not weeds but highly useful plants that yield a number of products having many important uses. The products obtained from the seaweeds may be divided into two groups: natural and derived. The natural products are those in which the seaweed itself is used as the end product. These may be whole, ground, or dried. Such products are used primarily for human food, for animal food, and for fertilizer. The derived products are those manufactured from seaweeds by chemical processes. Historically these products have included a wide variety of materials, such as iodine, acetone, and decolorizing carbon. The major derived products, both in the present and in the recent past, are those that have the ability to form gels and colloidal suspensions. In the United States, the principal colloidal products made from seaweeds are agar, algin, and carrageenin. Commercially these derived products are vastly more important than are the natural ones." The author discusses the growth habits of the green and blue-green algae, brown algae, and red algae; methods of harvesting; major constituents in seaweeds; and natural and derived products obtained from seaweed.

Canned Fish Retail Prices: FL-476e - February 1959, 27 pp. FL-476f - March 1959, 27 pp.

Canned Fish Consumer Purchases: FL-478a - December 1958, 32 pp. FL-478b - January 1959, 34 pp. FL-478c - February 1959, 34 pp. FL-478d - March 1959, 34 pp.

FL-484 - United States Tuna Fishery, 1911-1958, by E. A. Power, 15 pp., illus. Presents abrief history and discussion of the development of the tuna fishery--one of the United States' leading fishery resources. Included are statistical data on catch by species; imports and supply of fresh, frozen, and canned tuna; and catch and supply of bonito and yellowtail.

SL-157 - Firms Manufacturing Liver and Viscera Oil. 1958 (Revised).

SL-160 - Firms Manufacturing Menhaden Products, 1958 (Revised).

SL-161 - Producers of Packaged Fish, 1958 (Revised).

SSR-Fish. No. 249 - Gulf of Mexico Physical and Chemical Data From Alaska Cruises, compiled by Albert Collier, with note on "Some Aspects of the Physical Oceanography of the Gulf of Mexico," by Kenneth H. Drummond

- and George B. Austin, Jr., 422 pp., illus., October 1958.
- SSR-Fish. No. 262 Corrosion Resistance of Fish Tagging Pins, by Albert C. Jensen, 9 pp., illus., December 1958. Aquarium-held haddock were tagged with nickel and Type 304 stainless steel pins to compare the corrosion resistance of the two metals. The stainless steel pins proved to be superior.
- SSR-Fish. No. 267 Surface-Current Studies of Saginaw Bay and Lake Huron, 1956, by James H. Johnson, 89 pp., illus., December 1958.
- SSR-Fish. No. 268 Water Quality Studies in the Wenatchee River Basin, by Robert Wendell Seabloom, 39 pp., illus., October 1958.
- SSR-Fish. No. 269 Gulf of Mexico Plankton Investigations, 1951-53, by Edgar L. Arnold, Jr., 56 pp., illus., November 1958.
- SSR-Fish. No. 270 Large-Scale Experimental Test of Copper Sulfate as a Control for the Florida Red Tide, by George A. Rounsefell and John E. Evans, 62 pp., illus., December 1958.
- SSR-Fish. No. 271 A Laboratory for Fish Behavior Studies, by H. William Newman, 12 pp., illus., January 1959.
- SSR-Fish. No. 273 Background Information for Voluntary Grade Standards on Natural Sponges, by Robert B. Bennett, 60 pp., illus., May 1958. A report on background information for a grade standard on natural sponges. The author discusses types of important sponges; grading systems; major and minor faults; average demerits characteristic of each type and grade of sponge; grading standards and prices; quantitative tests; selling by weight; and recommendations for grading standards.
- SSR-Fish. No. 275 Spawning Escapement of Okanogan River Blueback Salmon (Oncorhynchus nerka), 1957, by Donovan R. Craddock, 12 pp., Illus., December 1958.
- SSR-Fish. No. 278 Physical Oceanographic, Biological, and Chemical Data--South Atlantic Coast of the United States, M/V Theodore N. Gill Cruise 7, by William W. Anderson and Jack W. Gehringer, 281 pp., illus., January 1959.
- SSR-Fish. No. 279 Physical, Chemical, and Biological Oceanographic Observations Obtained on Expedition Scope in the Eastern Tropical Pacific, November-December 1956, by Robert W. Holmes and other members of the Scripps Cooperative Oceanic Productivity Expedition, 123 pp., illus., November 1958.
- SSR-Fish. No. 284 Publications of the United States Bureau of Fisheries, 1871-1940, by Barbara B. Aller, 205 pp., December 1958. Discusses briefly the history of the Bureau of Fisheries and lists the publications of the Bureau from 1871 to 1940. More up-to-date publications of the Bureau of Fisheries and fishery publications of the Fish and Wildlife Service are also listed by series, authors, and subjects in Circular 36--Fishery Publication Index, 1920-54,

- price \$1.50 (for sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.).
- SSR-Wildlife No. 41 The Pacific Walrus, compiled by John L. Buckley, 33 pp., illus., December 1958. A review of current knowledge and of the Pacific walrus and suggested management needs. Excessive killing has reduced the Pacific walrus population from an estimated 200,000 to approximately 45,000 in the last 100 years. The decline is continuing. Present hunting methods result in the loss of half of the walruses killed; and only half of those retrieved are fully used. Suggestions for further investigations are included.
- Annual Report of the U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, for the Fiscal Year 1958, 44 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, For the Fiscal Year Ended June 30, 1958.) Summarizes the various activities of the Service. Describes the activities of the Bureau of Commercial Fisheries, Industrial Research and Services; Alaska Commercial Fisheries; Columbia River Fisheries Program; Pribilof Islands fur-seal industry; and biological research (coastal, inland, and marine fisheries); Bureau of Sport Fisheries and Wildlife activities discussed include Federal aid to the states for the restoration of fish and wildlife; fish hatcheries; fishery management services; and river basin studies.
- Sep. No. 551 Shrimp Explorations off Southeastern Coast of the United States (1956-1958).
- Sep. No. 552 Research in Service Laboratories (June 1959): Contains these articles --"Flavor and Odor of Fish - Progress Report;" "Further Results on Use of Fish Oil for Ore Flotation;" and "Shark Repellent."
- THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.
- California Fishery Products Monthly Summary,
 March 1959; 13 pp. (Market News Service, U.S.
 Fish and Wildlife Service, Post Office Bldg.,
 San Pedro, Calif.) California cannery receipts
 of tuna and tunalike fish and sardines; pack of
 canned tuna, mackerel, and anchovies; market
 fish receipts at San Pedro, Santa Monica, and
 Eureka areas; California and Arizona imports;
 canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna
 Boat Association auction sales; for the month
 indicated.
- (Chicago) Brokers and Importers of Fishery Products and Byproducts, Chicago, Ill., 1959, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.)
- (Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, March 1959; 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and

shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production, and
Shipments of Fishery Products, March 1959;
April 1959; 6 pp. each. (Market News Service,
U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States
shrimp, oyster, finfish, and blue crab landings;
crab meat production; LCL express shipments
from New Orleans; wholesale prices of fish and
shellfish on the New Orleans French Market;
and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1959; April 1959; 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries -- Annual Summary, 1958, by John J. O'Brien, 50 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the fish marketing trends and conditions at the principal New England fishery ports, and highlights of fisheries in other areas and in selected foreign countries. Presents food fish landings by ports and species; industrial fish landings and exvessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by months for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and monthly landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange.

New England Fisheries -- Monthly Summary, March 1959, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; coldstorage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

Seattle, Washington, Brokers and Importers of Fishery Products, 1959, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) (Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1959, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimplandings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENT, WASHINGTON 25, D. C.

Morphology of the White Shrimp (PENAEUS SET-IFERUS, Linnaeus 1758), by Joseph H. Young, Fishery Bulletin 145 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 59), 172 pp., illus., printed, \$1, 1959. The white shrimp of the Gulf of Mexico represents an important component of the commercial shrimp catch throughout the northern, western, and southern margins of that body of water. This study sets forth in detail the anatomy of the white shrimp.

"Observations Made From an Underwater Plastic Cage," article, The Progressive Fish-Culturist, vol. 20, no. 1, 1958, p. 48, processed, single copy 25 cents.

Study of Age Determination by Hard Parts of Albacore From Central North Pacific and Hawaiian Waters, by Tamio Otsu and Richard N. Uchida, Fishery Bulletin 150 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 353-363, illus., printed, 15 cents, 1959.

"A Tag Holder for Use in the Field," by A. C. Jensen, article, Progressive Fish-Culturist, vol. 20, no. 2, 1958, p. 96, processed, single copy 25 cents.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION. WRITE TO U.S. FISH AND WILDLIFE SERVICE, GULF FISHERY INVESTIGATIONS, GALVESTON, TEX., ABOUT IT SINCE THAT ORGANIZATION DID THE TRANSLATING.

The Shrimp Fishery in Panama I--Evaluation of Our Wealth in Shrimp, by M. D. Burkenroad, J. L. Obarrio, and C. A. Mendoza, translation no. 16, 15 pp., illus., processed. A report on some of the work and preliminary findings of the National Laboratory of Fisheries in Panama, dealing with the biological investigation of the Panama shrimp. The purpose of this investigation is to find out scientifically the potentialities of Panama's shrimp fishery. Some of the problems and methods of investigation are discussed. Density of fish populations and replacement problems of the large white shrimp are described in considerable detail.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION, WRITE TO U.S. FISH AND WILDLIFE SERVICE, PACTFIC SALMON INVESTIGATIONS, SEATTLE, WASH., ABOUT THEN SINCE THAT ORGANIZATION DID THE TRANSLATING.

Fishery Biology and International Regulation of Fisheries, by Hiroaki Aikawa, 19 pp., processed, Translation Series No. 19. (Reprinted from Suisan Kagaku (Fisheries Science), vol. 6, no. 3-4, December 1957, pp. 2-6). A Consideration of International Fisheries, Mainly in Relation to the U. N. Draft of Resolution on Seas, by Nagamitsu Asano, 24 pp., processed, Translation Series No. 21. (Reprinted from Suisan Kagaku (Fisheries Science), vol. 6, no. 3-4, December 1957, pp. 6-12).

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE OR-GANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADEN COLONY AND PROTECTORATE:

Aden, 1955 and 1956, 136 pp., illus., printed, single copy 7s.6d. (about US\$1.05). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1958. Contains a section on fisheries of Aden Colony and one covering those of Aden Protectorate. Each section on fisheries discusses areas and methods, organization of fishing industry and utilization of catches; marketing; events affecting production; fisheries department; and development. The fishing industry ranks second in the Colony but needs considerable development in the Protectorate. Catch statistics for the latter are included. Principal species caught are sardine, kingfish, and tuna.

ALGAE:

"Composition of the Nucleic Acids of Some Algae," by Eva M. Low, article, Nature, vol. 182, October 18, 1958, p. 1096, printed. St. Martins Press, Inc., 103 Park Ave., New York 17, N. Y.

ALGINATES:

"A Method for the Fractionation of Alginates," by R. H. McDowell, article, Chemistry and Industry, no. 43, October 25, 1958, pp. 1401-1402, printed. Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

ANTIBIOTICS:

"Fresh Fish. 1--Fish Preservation by Means of Antibiotics," by R. J. Nachenius and A. G. Pienaar, article, Annual Report, Fishing Industry Research Institute for April 11-December 31, 1956, vol. 10, p. 7, printed. Fishing Industry Research Institute, Cape Town, Union of So. Africa, 1957.

"Penetration of Chlortetracycline into Fish Flesh and Its Heat Inactivation," by Tetsuo Tomiyama, Yasuo Yone, and Kazuo Mikajiro, article, Nippon Suisan Gakkaishi, vol. 22, 1956-57, pp. 778-783, printed. Japanese Society of Scientific Fisheries, Tokaiku Suisan Kenkyujo, no. 3, Tsukijima, Chuo-ku, Tokyo, Japan.

AUSTRALIA:

Statistical Bulletin: Fishing and Whaling, Australia, no. 3, 1956-57, 18 pp., illus., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the third of a series of annual bulletins dealing with the fish-

ing and whaling industry in Australia. The statistics cover quantity and value of catch and related data, for the year 1956-57 for fisheries and the 1957 season for whaling, with comparative data for the previous 4 years. The bulletin is divided into two parts; the first dealing with fisheries and the other with whaling. The part on fisheries is subdivided into a section on edible fishery products-finfish, crustaceans, and molluscs; and another on pearl and trochus shells.

CALIFORNIA:

Forty-Fifth Biennial Report, California Department of Fish and Game (July 1, 1956, through June 30, 1958), 93 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., October 1958. This report covers in detail the activities of the Department of Fish and Game from July 1, 1956, through June 30, 1958. Also included are reports of policy decisions by the Fish and Game Commission, accounts of the activities of the Wildlife Conservation and the Marine Research Committee. The section on marine resources discusses sportfisheries -- party boat fishing, surf fishing, yellowtail, barracuda and white sea bass, and ocean habitat development (development of artificial reefs and new kelp beds); shellfisheries -- abalone, market crab, ocean shrimp, and oysters. This section also discusses the tuna, sardine, mackerel, and anchovy fisheries; bottom fisheries; rockfish; northern California sportfish; kelp studies; special projects; and the Department's research vessels. The section on inland fisheries discusses trout hatcheries and the research program, Kokanee salmon warm-water fishes, striped bass, and sturgeon. The section on salmon and steelhead covers the spawner shortage, proposed investigations program, inland river studies, coastal streams studies, silver salmon, and other activities.

CANADA:

"Canada's Shellfish Resources," by J. C. Medcof, article, Trade News, vol. 11, no. 9, March 1959, pp. 5-7, 9, illus., processed. Department of Fisheries of Canada, Ottawa, Canada. The author discusses the seven species of shellfish--scallops, oysters, soft-shell clams, quahaugs, bar clams, blue mussels and periwinkles--which are marketed in Canada. Squid, a mollusk but not usually thought of as shellfish, are also marketed. In discussing what has been done for improvement of the shellfish fisheries of Canada, the author states that "Studies of shellfish have been conducted by scientists of the Federal Department of Fisheries and its Research Board with encouraging results in the search for ways of boosting the depressed or undeveloped state of the shellfish fisheries. New scallop beds have been discovered and industry has built large and small scallop boats, resulting in greatly increased landings. Methods have been devised for cleaning oysters, soft-shell clams, and quahaugs from beds that may be subject to contamination. Bait-worms were discovered in southwestern Nova Scotia which now bring C\$40,000 a year to former clam diggers. And efforts to reestablish disease-ravaged oyster populations are promising although they will not bear fruit for several years.... Efforts to boost the shellfish fish-

eries are continuing. We are encouraging heavier harvesting of little-used species like bar clams, urging exploitation of known stocks of unused species like razor clams, and exploring for stocks of species like ocean quahaugs which might be valuable, although they are little known or used by industry. Besides this we are continuing efforts to improve and popularize efficient mechanized methods of fishing shellfish."

Journal of the Fisheries Research Board of Canada, vol. 16, no. 2, March 1959, pp. 147-246, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, the following articles: "The Incidence of Nematodes in the Fillets of Small Cod from Lockeport, Nova Scotia, and the Southwestern Gulf of St. Lawrence," by D. M. Scott and W. R. Martin; "Spoilage of Fish in the Vessels at Sea. 6--Variations in the Landed Quality of Trawler-Caught Atlantic Cod and Haddock During a Period of 13 Months," by C. H. Castell, Jacqueline Dale, and Maxine F. Greenough; "Biochemical Studies on Sockeye Salmon During Spawning Migration. V -- Cholesterol, Fat, Protein, and Water in the Body of the Standard Fish," by D. R. Idler and I. Bitners: and "Proteins in Fish Muscle. 15--Note on the Preparation of Actin from Cod Muscle with Potassium Iodide," by J. R. Dingle.

Supplement to Hinks! "The Fishes of Manitoba," by J. J. Keleher and B. Kooyman, FRB 481, pp. 103-117, printed. Department of Mines and Natural Resources, Province of Manitoba, Winnipeg, Canada, 1957.

CANNED FOODS:

Technical Aspects of the Evaluation of Canned Foods, by H. Cheftel, Bulletin No. 13, 52 pp., printed. Laboratoire de Recherches, Billancourt, France, July 1957.

CATFISH:

"The Reproduction and Early Development of the Sea Catfish, Galeichthys felis, in the Biloxi (Mississippi) Bay," by J. W. Ward, article, Copeia, no. 4, 1957, pp. 295-298, printed. American Society of Ichthyologists and Herpetologists, 34th St. and Girard Ave., Philadelphia 4, Pa.

CHILLING AND FREEZING:

Hvor Langt er Forskningen Naet Vedrorende Koling og Frysning af Fisk. (Research on Chilling and Freezing of Fish), by F. Bramsnaes, 8 pp., illus., printed in Danish with English summary. (Reprinted from Kulde, vol. 12, no. 6, 1958 pp. 61-64 and vol. 13, no. 1, 1959, pp. 5-9.) Fiskeriministeriets Forsogslaboratorium, Copenhagen, Denmark, 1959.

COD-

Additions to Laboratory Leaflets 19 and 20 Concerning the Bear Island Cod Fishery, Laboratory Leaflet No. 22 (restricted distribution), 2 pp., processed. Ministry of Agriculture, Fisheries, and Food, Fisheries Laboratory, Lowestoft, England, June 1958. Further information

on prospects for the fishery and predictions on size of fish are presented. Information is given on water conditions and fish distribution; ice reports; and stock size and small fish. According to this report, much of the destruction of small cod could be avoided by using a cod-end mesh a little larger than the regulation $4\frac{1}{2}$ inches in the Bear Island fishery. A 5-inch mesh is recommended.

La Peche Maritime, vol. 38, no. 972, March 1959, 84 pp., illus., printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France. Contains, among others, the following articles: "Vieille de Quatre Siecles, l'Industrie Francaise de la Morue Sera-t-Elle Contrainte a l'Abandon?" (Will the French Cod Fishing Industry, Four Centuries Old, Have to be Abandoned?), by Jean Le Touze; "L'Evolution du Marche de la Morue Amenera-Elle Prochainement une Nouvelle Orientation de la Flotte de Peche" (Will the Development of the Codfish Market Soon Bring About a New Orientation of the Fishing Fleet?), by Henri Quesney; "Difficultes Pour l'Armement et le Negoce Bordelais de la Morue en 1958" (Difficulties for the Cod Canning and Barrel Trade in 1958), by J. Huret; "Premier Consommateur de Morue Seche du Monde, le Portugal Veut Developper la Production Nationale," (Portugal, World's First Consumer of Dried Codfish, Plans to Develop Its National Production), "La Production Espagnole de Morue Salee Atteint 40,000 T." (The Spanish Production of Salt Codfish reaches 40,000 Tons); and "L'Industrie de la Morue au Canada" (The Codfishing Industry in Canada).

"Two Poisoning Outbreaks in Puerto Rico From Salt Preserved Codfish," by Alfonse T. Masi, Rafael A. Timothee, Rolando Armijo, Darwin Alonso, and Luis E. Mainardi, article, Public Health Reports, vol. 74, no. 3, March 1959, pp. 265-270, illus., printed. U. S. Department of Health Education, and Welfare, Public Health, Service, Washington 25, D. C.

COMMISSIONS:

Seventeenth Annual Report of the Atlantic States Marine Fisheries Commission (to the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States), 104 pp., printed. Atlantic States Marine Fisheries Commission, 22 West First St., Mount Vernon, N. Y., March 1959. Includes a report on the state of the Commission and the work of the three basic committees--scientific, legal, and executive. Also contains reports from the North Atlantic Section on studies dealing with Georges Bank scallops; salt water fishing licenses for anglers; starfish invasion of Long Island Sound; and Enfield Dam. The Middle Atlantic Section reports on the offshore fishery for shad; estuarine problems; proposed saltwater barrier in the Delaware River; social problems of fishery research; improvement of catch statistics; effects of inshore dragging; hard clam fishery in Nantucket Sound; and starfish invasion of Long Island Sound. The Chesapeake Bay Section discusses offshore seining for shad; the blue crab research project; improvement of

catch statistics; waste disposal in Baltimore Harbor; and passage of fish over the Conowingo Dam. The South Atlantic Section reports on the blue crab project; estuarine research; dangers of insecticides; catch statistics; impact of weather (freezes and summer droughts) on marine fisheries; exploratory fishing in the South Atlantic Section; existing shrimp program and reciprocity of shrimp licenses; enforcement of conservation regulations; and development of artificial crab bait. Appendices include, among others, reports of the Scientific Committee's Biological and Technological Section; report of the Legal Committee; a plan for estuarine research; social problems of fisheries research; and a summary of action taken on the Commission's resolutions or recommendations to the Bureau of Commercial Fisheries, 1957-58.

COOPERATIVES:

Check List of Background Material on Fishery
Cooperatives, FAO/57/11/8640, 14 pp., processed; Check List of Background Material on Fishery Cooperatives (Addendum), FAO/57/12/8733, 1 p., processed. Food and Agriculture Organization of the United Nations, Rome, Italy. Lists of publications dealing specifically with fishery cooperatives assembled in connection with the FAO Training Center on Fishery Cooperatives in the Indo-Pacific Region.

CURING:

"A New Method for the Production of Smoke," by H. Olsen, article, Konserves, vol. 15, June 1957, p. 61, printed in Danish. Vester Farimagsgade, 31, Copenhagen V, Denmark.

DENMARK:

Arsberetning fra Fiskeriministeriets Forsøgslaboratorium for 1958 (Annual Report to the Danish Fishing Industry for 1958), 39 pp., illus., printed in Danish with English translation of the main experimental results. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1959.

Publikationer fra Fiskeriministeriets Forsøgslaboratorium, 1945-1958 (Publications from Technological Laboratory, Ministry of Fisheries), 15 pp., processed, in Danish and English. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, March 1959.

DISTRIBUTION OF FISHES:

Principles of the Distribution of Fishes and the Geological History of the Far-Eastern Seas, by G. U. Lindberg, Fisheries Research Board of Canada, Translation Series No. 141, 12 pp., processed. (Translated from Ocherki po Obshchim Voprosam Ikhtiologii, pp. 47-51, 1953.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Some Characteristics of the Distribution of Bottom and Demersal Fishes of Far-Eastern Seas, by P. A. Moiseev, Fisheries Research Board of Canada, Translation Series No. 94, 10 pp., processed. (Translated from Izvestiia Tikhookeanskovo Nauchno-Issledovatelskovo In-

stituta Rybnovo Khoziaistva i Okeanografii, vol. 37, 1952, pp. 129-137, Viadivostok.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

DUNGENESS CRAB:

The Fishery and Biology of the Dungeness Crab (CANCER MAGISTER Dana) in Oregon Waters, by Kenneth D. Waldron, Contribution No. 24, 43 pp., illus., printed. Fish Commission Research Laboratory, Rte. 1, Box 31A, Clackamas, Ore. Results of studies beginning in 1947 on the biology of the Dungeness crab in Oregon coastal waters. A review is made of the history of the fishery with regard to trend of the catch by magnitude, area, and season; the development and conduct of the fishery itself; and the regulations governing the fishery.

FILLETS:

"The Expressible Fluid of Fish Fillets," by R. M. Love and O. Karsti, article, Journal of the Science of Food and Agriculture, vol. 9, May 1958, pp. 249-268, printed. Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England.

FISH BAIT:

Fish Bait Culture and Care, by S. Bradley Krochmal, 44 pp., illus., printed, \$1. S. Bradley Krochmal, Suncook, N. H., 1956.

FISH FLOUR:

Studies on the Use of Deodorized Fish Flour in Malnutrition (Preliminary Report), by Federico Gomex, Rafael Ramos-Galvan, Joaquin Cravioto, Silvestre Frenk, and Isabel Labardini, 9 pp., illus., printed in English. (Translated reprint from Boletin Medico del Hospital Infantil, vol. 15, no. 4, pp. 485-493.) Hospital Infantil, Mexico D. F., this project is part of a series of attempts in the search of an adequate supplement for ordinary diets in the Mexican population. For the past two years, the Nutrition Department of the Children's Hospital has been studying fish flour. Results indicate that fish flour can be added, in varying percentages, to corn meal, beans, and a number of other foods. Further studies are being carried out at clinical, laboratory, and community level to test more completely the potentialities of this protein supplement.

FISH MEAL:

Fish Flour and Fish Meal by Azeotropic Solvent Processing, by Ezra Levin, 4 pp., illus., printed. (Reprinted from Food Technology, vol. 13, no. 2, 1959, pp. 132-135.) The Garrard Press, 510 North Hickory, Champaign, Ill. There is now being manufactured at New Bedford, Mass., a standardized, uniform, stable whole fish meal, equal to the fish from which it is derived, in biological value of protein, in unidentified growth factors, at a competitive price with conventional fish meals. It is biologically assayed and is standardized to have values 20 percent higher than an isolated vegetable protein. The advantages of this process of manufacturing fish meal are presented.

"Fish Meal. 12--Temperature Differential Controller," by L. J. Besseling and A. M. Lewis, article, Annual Report, Fishing Industry Research Institute, 1955-56, vol. 9, p. 29, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa.

"Spontaneous Heating of Fish Meal," by G. M. Dreosti and A. N. Rowan, article, Annual Report, Fishing Industry Research Institute, 1957, vol. 11, pp. 39-45, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1958.

FLORIDA:

(Florida State Board of Conservation) 13th Biennial Report, 1957-1958 (Salt Water Fishing), 59 pp., illus., printed. Florida State Board of Conservation, Tallahassee, Fla., 1959. Describes the activities of the Florida State Board of Conservation during 1957-58, summarizing the goals attained and progress achieved in the betterment of salt-water conservation. Includes chapters on conservation, sports fishing, administration of the conservation Department, research, oyster culture and rehabilitation, enforcement, licensing, seafood promotion, information-education, commercial fish landings, and commercial fishing statistics. It was found necessary, during the first half of 1958, to temporarily close the Tortugas shrimp area in the interest of conservation. That this conservation measure was sound is shown by shrimp landing reports for 1958. Despite the closed season, Tortugas yielded 8 million pounds more shrimp than it did in 1957. A major outbreak of red tide during the fall of 1957 on Florida's west coast caused the loss of countless fish. An extensive attempt was made at control by spraying copper sulphate from crop-dusting airplanes and from the State Board of Conservation's research vessel Mayan. According to this report, "When the test was finally discontinued in December 1957, a thorough analysis of the effects of the control measure was begun. This evaluation is continuing but at present it appears that the cost of extensive application would be enormous, the effect is shortlived, and side-effects on other marine life are uncertain.'

"Report on the Sport and Commercial Fisheries of the Braden and Manatee Rivers," by James F. Murdock, article, Report of the Marine Laboratory of the University of Miami, no. 57-23, 1957, 22 pp., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

FOOD AND AGRICULTURE ORGANIZATION:

Catalogue of FAO Fisheries Publications, compiled by Patricia M. Andrews, FAO/58/9/6896, September 1958, 18 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 1, January 1959, 158 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Formerly titled Current Bibliography for Fisheries Sciences.

FOREIGN TRADE:

Exporting to the United States, 86 pp., illus., printed, 50 cents. Bureau of Customs, U. S. Treasury Department, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.). This booklet was prepared primarily for the information and assistance of those who plan to export to the United States. The volume and complexity of imports into this country make it necessary that certain definite procedures be followed, and those who import into the United States must have the cooperation of the exporter in order to follow the necessary procedures. In addition, there are some requirements, such as those relating to marking and preparation of invoices, which must be met by the exporter himself. This booklet outlines the procedures.

FREEZING:

Changes During Freezing and Thawing of Fish," by J. Freixo, article, Conservas de Peixe, vol. 13, no. 146, May 1958, pp. 27-28, printed in Portuguese. Conservas de Peixe, Sociedade Astoria, Lda., Requeirao dos Anjos, 68, Lisbon, Portugal.

FREEZING FISH AT SEA:

'La Congelation a Bord au Japon" (Freezing Aboard Vessels in Japan), by R. Daval, article, La Pêche Maritime, vol. 37, no. 961, April 1958, pp. 215-216, illus., printed. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France. Reviews the experimental work done in Japan on fish chilling and freezing. As rebelieves that a chilling and storage temperature 1°C. above the fraction C. above the freezing point is suitable. When freezing, the whole mass of the fish must be frozen. The duration of storage in good condition was from 1 to 6 weeks for the chilled fish and from 3 to 12 months for the frozen fish. Three types of vessels were selected to be equipped with refrigerating plants: fishing boats, motherships, and fish carriers. Most of the refrigerating units used ammonia as the refrigerant in direct expansion systems. Only the motherships used indirect systems with circulating brine. Three systems of refrigeration were used: air blast, circulating brine, and circulating refrigerated sea water. The Japanese recommend thawing the fish before cooking; in France, the frozen fish is cooked immediately after removal from storage.

FRESHNESS OF FISH:

"Fresh Fish. 3--The Assessment of the Freshness of Fish by Odor," by A. N. Rowan, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, pp. 8-11, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

GEAR:

"Instrument for Adjusting Equal Lengths of Warp Lines of Trawling Gear," by A. Bulmann, article, Die Fischereiwelt, vol. 9, September 1957, p. 57, printed in German. Die Fischereiwelt, Bundesministerium für Ernährung, Landwirtschaft

und Forsten, Bremerhaven, German Federal Republic.

Modern Fishing Gear of the World, edited by Hilmar Kristjonsson, 680 pp., illus., printed in English with abstracts in French and Spanish, Ł5.5s. (US\$14.75). Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London, E. C. 4, England, 1959. According to the Food and Agriculture Organization of the United Nations,
"More progress in the methods of catching fish has been made in the last thirty years than in the preceding three thousand. Today the waters of the world provide 30,000 tons of edible fish annually and biologists estimate that that figure could be doubled without depleting stocks." To assist in that commercial expansion, the Food and Agriculture Organization has been steadily spreading knowledge of the most modern fishcatching techniques. In September 1957, a major Congress (International Fishing Gear Congress) attended by some 500 delegates from all fishing countries of the world, was held in Hamburg to hear and discuss over 100 papers on all types of fishing gear and equipment. On the foundation of those papers and discussions this book was issued by the Food and Agriculture Organization. A fine editorial job of compression and selection has been done. The papers contributed have been arranged in thirteen logical sections, amplified where necessary and supplemented as required to round out as full and authoritative a presentation as has ever been issued on all aspects of modern fish-catching equipment. The sections range from details and advantages of natural and artificial fibers as used in fishing lines and net making, methods of specifying gear, the operation of all types of gear, the attraction of fish by light, and the location of fish by electronic methods, and finally there is a chapter on electrical fishing and certain factory operations at sea. In a total of some 680 pages are packed nearly half a million words as well as over 800 illuminating specific diagrams and general illustrations, making the whole a quite remarkable compendium of solid information. The book contains a particularly comprehensive index making it invaluable for reference by practical fishermen, fishery technologists, and manufacturers of all types of fishing gear from nets and trawls to floats, trawl boards, and all types of electronic gear for fish finding.

GENERAL:

Development of Commercial Fish Stocks From Lake Kronotsk, by E. M. Krokhin and I. I. Kurenkov, Fisheries Research Board of Canada, Translation Series No. 97, 4 pp., processed. (Translated from Akademiia Nauk SSSR, Ikhtiologicheskaia Kommissiia, Trudy Soveshchanii, No. 4, 1954, pp. 156-159, Moscow.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1958), 66 pp., illus., printed, 1959. Wildlife Management Institute, Wire Bldg.,

Washington 5, D. C. This is the second annual report of the Federal Aid Programs to highlight one particular phase of the States' activities. For 1958 it is "stocking--one of the tools;" succeeding reports will highlight other activities of the fish and wildlife programs. This report contains a general program review, sport fish restoration activities, wildlife restoration activities, an extensive summary of stocking, and a summary of projects approved by the various states during fiscal year 1958. The total amount available to the States and Territories under the Federal Aid programs in 1958 was slightly more than \$28 million. Sport-fish restoration activities placed greater emphasis on investigational work than the previous year. The report was prepared by the Branch of Federal Aid of the Bureau of Sport Fisheries and Wildlife.

Laws Governing the Fluctuations in Abundance of Important Commercial Fishes, and Methods of Making Catch Predictions, by T. F. Dementeva, Fisheries Research Board of Canada, Translation Series No. 185, 22 pp., illus., processed. (Translated from Trudy Soveshchanii, No. 1, 1953, pp. 19-36, Akad, Nauk SSSR, Ikhtiologicheskaia Kommissiia, Moscow.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

"Some Notes on Fisheries in the New Hebrides, Fiji, and Tokelaus," by H. van Pel, article, SPC Quarterly Bulletin, vol. 9, no. 1, January 1959, pp. 42-43, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. The author discusses fisheries developments in the New Hebrides, stocking of rivers in the Fiji Islands, and shell introduction into the Tokelau Islands.

GERMANY:

"Die Deutschen Kohleranlandunger 1946/47-1956/57 aus Norwegischen und Islandischen Gewassern und ihre Abhangigkeit vom Fischbestand" (The German Coal-Burning Vessels Landings 1946/47-1956/57, and their significance on the Fish Stocks), by Ulrich Schmidt, article, Berichte der Deutschen Wissenschaftlichen Kommission fur Meeresforschung, Neue Folge, band XV, heft 2, 1958, pp. 145-158, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart, Germany.

HADDOCK:

"Untersuchungen uber die Vernichtung Untermassiger Schellfische Durch die Deutsche Herings-Schleppnetzfischerei in der Nordsee" (Assessments on the Destruction of Undersized Haddock by German Herring Trawling in the North Sea), by Dietrich Sahrhage, article, Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, band XV, heft 2, 1958, pp. 105-131, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart, Germany.

HERRING:

International Herring Tagging in the North Sea, 1958, Laboratory Leaflet 23, 3 pp., illus., printed.

Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England, July 1958.

Rapports et Proces-Verbaux des Reunions (Contributions to Special Herring Meetings, 1956-On Herring "Races"), vol. 143, part 2, 158 pp., illus., printed in English and French, Kr.30 (about US\$4.35): Conseil Permanent International pour l'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, March 1958.

The Stock of Herring and the Herring Fisheries on the West Coast of Sweden in the First Half of the Twentieth Century, by Karl A. Andersson, Series Biology, Report No. 8, 40 pp., illus., printed. Fishery Board of Sweden, Institute of Marine Research, Lysekil, Sweden, 1958.

"Untersuchungen an der Heringslarvenbevolkerung der Innenjade" (Research on the Herring Larvae Populations of the Inner Jade Bay), by Von A. Buckmann and G. Hempel, article, Helgolander Wissenschaftliche Meersuntersuchungen, band 6, heft 1, 1957, pp. 52-70, illus., printed in German. Forschungsinstitut der Bundesanstalt fur Fischerei, List auf Sylt, Helgoland, Germany.

HONG KONG:

Hong Kong Annual Departmental Report by the Director of Agriculture, Fisheries & Forestry (for the Financial Year 1957/58), 131 pp., illus., printed, HK\$4.00 (about 70 U. S. cents). Government Printer, Java Road, Hong Kong. This publication contains the annual reports of the various divisions of the Department of Agriculture, Fisheries and Forestry. Included in the report of the Fisheries Division is a review of its activities during the year, which were directed mainly to the marine fisheries and the mechanization of the fishing fleet, fishery investigations, training of fishermen, fresh-water fisheries, oyster culture, and pearl culture. Charts in the appendix show distant-water and main fishing grounds utilized during 1957/58. Statistical data are also given on landings of the principal species of fish in 1957/58 and on fishing vessels.

IRELAND:

Report on the Sea and Inland Fisheries for the Year 1956 (Incorporating Statistics of the Capture of Salmon, Sea Trout and Eels), 104 pp., illus., printed, 4s (about 56 U. S. cents). Government Publications Sale Office, G. P. O. Arcade, Dublin, Ireland. This report covers the activities of the Fisheries Division of the Department of Lands, and includes statistics on the quantity and value of Ireland's sea and inland fish and shellfish for 1956, and related data. Also includes, among others, sections on shrimp and crab fishing, salmon on the River Moy, and fertilization of some acid or bog lakes in Ireland.

IRISH MOSS:

"The Stability of Carrageenin in Dried Irish Moss (Chondrus crispus)," by E. Gordon Young and D. A. I. Goring, article, Journal of the Science

of Food and Agriculture, vol. 9, September 1958, pp. 539-541, printed. Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

IRRADIATION:

"Microbiological Aspects of Radiation Preservation of Food," by C. F. Niven, Jr., article, Annual Review of Microbiology, vol. 12, 1958, pp. 507-524, printed. Stanford University, Palo Alto, Calif.

JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 9, no. 4, February 1959, pp. 259-364 and 4 pp. supplement, illus., printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following articles: "Study on the Salmon Fishing Grounds in the North Pacific Ocean," by Tatsuaki Maeda; "Studies on Complete Utilization of Squid (Ommastrephes sloani pacificus). XVIII--On the Manufacture of Salted Dried Squid Meat," by Terushige Motohiro, Seigo Fukushima, and Eiichi Tanikawa; "Quality of Edible Seaweeds Belonging to the Laminariaceae. 2--Studies on the Quality of Laminaria japonica," by Kiichi Murata, Keiichi Oishi, Yuko Tamura, Eiji Kanai, Yukiko Wada, Ichiro Shibata, and Takahisa Kimura; "Studies on the Decomposition of Alginic Acid (Preliminary Report)," by Miki Oguro; "Quality of Edible Seaweeds Belonging to the Laminariaceae. 1--Evaluation of the Quality," by Keiichi Oishi, Yuko Tamura, Kinji Sasaki, and Kiichi Murata; and "Chemical Studies on Hering Meat (2)," by Shigeo Sasa.

Bulletin of Tokai Regional Fisheries Research Laboratory, no. 20, May 1958, 120 pp., illus., printed in Japanese with English summaries. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Includes, among others, the following papers: "A Mathematical Consideration of the Effect of Mortality and Growth on a Fish Population," by S. Tanaka; "Some Aspects on the Water-Soluble Proteins of Squid Muscle," by J. J. Matsumoto; and "Histological and Histochemical Study of Processing the Squid Meat--I. Histological Properties of Squid Meat," by T. Tanaka.

Bulletin of Tokai Regional Fisheries Research
Laboratory (Fisheries Agency) No. 21, August
1958, 62 pp., illus., printed in Japanese with
summaries in English. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku,
Tokyo, Japan. Contains these articles: "A Consideration on the Rational Exploitation of the
Stock of Sardine, Sardinops melanosticta (T. & S.),"
by S. Tanaka; "Efficiency of a Trawl Kite Compared with Ordinary Trawlers," by S. Takayama
and T. Koyama; "Swelling, Elongation, Breaking
Strength, and Elasticity of Synthetic Snell Lines,"
"Breaking Strength of Amilan Rope at Low Temperature," "Preserving Effect of Copper Naphthenate for Fishing Nets," and "Effect of Tar
Acids on Synthetic Fiber Fishing Twine," by I.
Hayashi; and "Action of Polyphosphates in Fish
Sausage Products--I. Influence of Processing

Conditions on the Effects of Phosphates," by M. Okada and A. Yamazaki.

Journal of the Tokyo University of Fisheries, vol. 44, nos. 1-2, March 1958, 152 pp., illus., printed. The Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Contains, among others, these articles: "Influence of Change of Storage Temperature, Refreezing and Rethawing, and Defrosting Processes upon Drip from Frozen Whalemeat," by K. Tanaka, and T. Tanaka; "Effect of Bleeding Process Before Freezing upon Quality and Protective Effect of Glazing and Packaging Materials After Freezing Against Moisture Evaporation During Cold Storage of Frozen Whalemeat and Skip-jack," and "Freezing, Cold Storage, and Defrost-ing of Whole Round Skipjack," by K. Tanaka; "Study on the Disposition of Fish Toward the Light.2--The Strength of Illumination Preferred by Fish," by Y. Imamura; "Enrichment Pattern Resulting from Eddy Systems in Relation to Fishing Grounds," by M. Uda and M. Ishino; and "On the Bottom Character of the Submarine Oil Field in the Continental Shelf of Northeast Honsyu, Japan, and a Consideration on the Relation Between Submarine Oil Field and Insular-shelf or Fisheries Bank," by H. Niino.

"The Marine Algae of Southern Saghalien," by Jun Tokida, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 2, no. 1, December 1954, 298 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

A Review of the Japanese Salmon Fishery, by Albert M. Day, and Milo Moore, 27 pp., illus. processed. Oregon Fish Commission, 307 State Office Bldg., 1400 S. W. 5th Ave., Portland 1, Ore., 1959. This report describes the authors' impressions of Japanese fisheries while serving as advisors to the North Pacific Fisheries Commission in Tokyo during November 2 to 16, 1958. The authors discuss the importance of the Japanese fisheries; the Tokyo fish market; the Hokkaido salmon hatchery system; rearing ponds; fry release; and natural spawning. Statistical tables are included which cover various aspects of the salmon fisheries. The authors state that the people of Japan are more dependent upon the fish resources of the open seas and their inland rivers than any other people on earth.

"The Species of Gracilaria and Gracilariopsis from Japan and Adjacent Waters," by Hikoei Ohmi, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 6, no. 1, December 1958, 87 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Studies on the Manufacture of Algin From Brown Algae," by N. Suzuki; article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 3, no. 1, August 1955, printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Studies on the Technical Problems in the Processing of Canned Salmon," by Eiichi Tanikawa,

article, $\underline{\text{Memoirs of}}$ the $\underline{\text{Faculty of}}$ $\underline{\text{Fisheries}}$, $\underline{\text{Hokkaido University, vol. 6, no. 2, December}}$ 1958, pp. 67-138, illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Results of studies dealing with decomposition of canned salmon. In clarifying the cause of decomposition, the author states that "According to the observations, the cans were understerilized. This may be due to the fact that even if unfresh raw salmon was prepared for the canning, the processing temperature and time used were the same as in case of fresh raw material." The author has made a scale which shows the adequate processing time corresponding to the various degrees of freshness of raw salmon used. He states that "By this scale, the freshness of raw salmon can be estimated, when the leaving time between catching and processing and storing temperature of the raw materials are already known. Next, when the degree of freshness is known, the adequate processing time will be determined at the certain definite processing temperature. The blackening of the canned salmon is affected by the freshness of the raw salmon, and the smell of the canned salmon packed in coated-cans is also affected by the freshness." The smell of the canned salmon prepared from frozen salmon was studied. This smell was clarified to be formed from the oxidation of raw salmon fat and oil during the freezing storage. "So," the author concludes, "frozen salmon should be prepared for canning within 50 days of storage. In order to prevent the oxidation of oil, 'Sustane 1-F' should be applied to raw salmon and the salmon should then be frozen. The freshness of the raw salmon plays the main part. Therefore, in salmon canning, the raw material should be always fresh, and the treatment should be performed rapidly."

KELP.

The Relationship Between Sportfishing in the Kelp Beds and the Harvesting of Kelp off the Coast of California, by David H. Davies, Kelp Investigations Program, IMR Reference 58-4, 65 pp., illus., processed. Institute of Marine Resources, University of California, La Jolla, Calif., January 10, 1958.

"A Test on Kelp Supplement," by Thomas F. Daly, article, American Fur Breeder, vol. 32, no. 2, February 1959, pp. 16-17, illus., printed, single copy 50 cents. Fur Farms Publications, Inc., 405 East Superior St., Duluth 2, Minn. This is a report of a controlled test using Norwegian seaweed as a supplement to mink feed. According to the researcher, the test showed that it reduced feed cost and at the same time helped to produce better pelts.

KENYA:

Lake Victoria Fisheries Service, Annual Report 1957/58, 45 pp., illus., printed. East African High Commission, Nairobi, Kenya, 1958. Reports on the general activities of the Lake Victoria Fisheries Service, including studies on motor fishing vessels, radio equipment, random-sample recording, improved fishing boats, deep-water fishing survey, fish meal, experimental fishing, use of gill nets, tilapia fish ponds,

fish marking, legal enforcement, and fish culture. Also presents statistical summaries of annual catches in 1957 at recording stations in Uganda, Tanganyika, and Kenya.

LOUISIANA:

Freshwater Commercial Fishing in Louisiana," by Lloyd Posey, article, Louisiana Conservationist, vol. 11, no. 3, March 1959, pp. 2-4, illus., printed. Louisiana Conservationist, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. Louisiana has approximately 2,000 square miles of fresh-water areas, many of which are utilized in the commercial fishing industry. A variety of gear is used in the fresh-water fisheries. State law requires that each unit of fishing gear be licensed. Catfish, buffalofish, silver carp, gar, and spoonbill are some of the primary commercial fish caught and sold in that State. For the last three years the State of Louisiana has conducted a research project to determine, among other things, the effect of commercial fishing on game fish populations. According to the author, many species of commercial fish, especially members of the sucker family, are notorious for their ability to rapidly overpopulate a body of water. "In areas of high concentration, they muddy the water and root up the bottom like a herd of hogs." When commercial fish are removed from an area this allows the game fish to take advantage of the additional food and space.

MARINE BORERS:

Marine Borers, a Preliminary Bibliography, by William F. Clapp and Roman Kenk, no. PB 131481, 355 pp., processed, \$5.00. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., February 1956.

Marine Borers, a Preliminary Bibliography,
Part II, by William F. Clapp and Roman Kenk,
no. PB 131058, 358 pp., processed, \$4.75. Office of Technical Services, U. S. Department of
Commerce, Washington 25, D. C., June 1957.

MARINE RESEARCH:

Recent Advances in Marine Fishery Research Along the Atlantic Coast (A Report of the Biological Section of the Scientific Committee to the Atlantic States Marine Fisheries Commission), 36 pp., processed. Atlantic States Marine Fisheries Commission, 22 W. First St., Mount Vernon, N. Y., August 1958. At meetings of sectional units of the Biological Section of the Scientific Committee it was agreed to prepare for the Commissioners; as informational background for the 1958 Annual Meeting, summaries of progress in research on some of the major Atlantic Coast fish and shellfish. These progress reports form the main body of this volume. A table is included showing the important Atlantic fisheries in order of value.

MARLIN:

"Preliminary Analysis of the Distribution of White Marlin, Makaira albida (Poey), in the Gulf of Mexico," by Robert H. Gibbs, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 4, 1957, pp. 360-369,

printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

MEDITERRANEAN FRESH-WATER FISHERIES:

Inland Water Fisheries in the GFCM Member Countries, Studies and Reviews No. 5, 20 pp. illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, February 1959. Presents the results of a study utilizing a questionnaire answered by the GFCM (General Fisheries Council for the Mediterranean) member countries. The information assembled was summed up in table form, and circulated to the participants of the fifth meeting of the GFCM (1958) as working document No. D-2. The member countries are Egypt, France, Greece, Italy, Israel, Morocco, Spain, Tunisia, Turkey, United Kingdom (Malta), and Yugoslavia. Statistical tables are included showing: population and fish production; inland-water fish production; imports-exports; present situation of fish culture; per capita yearly consumption; population habits concerning fish consumption; government policy concerning fish culture; fish species used for cultivation; proportion of fresh-water fisheries in total fish production.

MIDWATER TRAWL:

"The Midwater Trawl with Four Otter Boards," by J. Von Eitzen, article, Die Fischereiwelt, vol. 9, August 1957, p. 61, printed. Bundesministerium fur Ernahrung, Landwirtschaft und Forsten, Bremerhaven, German Federal Republic.

MINK FEED:

"The Recent Rise in Landings of Whole Fish for Mink Feed in British Columbia," by C. R. Forrester, article, Progress Reports of the Pacific Coast Stations, no. 111, August 1958, pp. 20-21, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

MULLET:

"Offshore Spawning of the Striped Mullet, Mugil cephalus, in the Gulf of Mexico," by Edgar L. Arnold, Jr. and John R. Thompson, article, Copeia, no. 2, 1958, pp. 130-132, printed. American Society of Ichthyologists and Herpetologists, 34 St. and Girard Ave., Philadelphia 4, Pa.

NETS:

"Synthetic Drift Nets--Some Preliminary Observations," by I. D. Richardson, article, World Fishing, vol. 8, no. 4, April 1959, pp. 76-78, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London, N. W. 1, England. Interest has been shown by the English herring industry in the possible use of the new synthetic fibers as a replacement for the cotton drift net. The author describes some tests that were made to compare the two materials, and in summary he states that "The main point of interest is that the fishing size of the cotton net is considerably smaller than the dry mesh size; whereas in the case of the synthetic net tested, the wet mesh size is similar to its

dry mesh size. Thus a mesh of the same dry size in each material will not fish at the same size in the water, and due allowance must be made." Only one type of synthetic material was used for comparison, so the results do not necessarily apply to herring drift nets made of any other synthetic material.

NEW JERSEY:

Annual Report, New Jersey Department of Conservation and Economic Development, Division of Fish and Game (For the Fiscal Year Commencing July 1, 1955 and Ending June 30, 1956), 44 pp., illus., printed. Department of Conservation and Economic Development, Trenton, N. J., June 30, 1956. Reports on the activities of the Division of Fish and Game during the fiscal year 1955/56; lists the regulations for 1956 (Fish and Game Code); and includes sections on law enforcement and conservation education and public relations. A section of the report discusses the fisheries management program, fisheries field operations, federal aid to fisheries, 1955/56 salvage operations and values, Federal distribution of fish, New Jersey landings for the calendar year 1955, and stocking of inland waters by the State Division of Fish and Game. A section is also included on wildlife management.

NIGERIA:

Annual Report of the Fisheries Department of the Eastern Region of Nigeria for the Year, 1957-58, 5 pp., printed, Is. (14 U. S. cents). The Government Printer, Enugu, Nigeria, November 1958. This report covers activities of the Fisheries Department, including procurement of surf boats, recruitment of trainee fishermen at two fishing stations, stocking of fish ponds, the fish farm at Umuna, and choice of a site for a base for powered sea-fishing boats at Jamestown.

NORWAY:

"Fiskerne og Farkostene i Vintersildfisket, 1958" (Fishermen and Craft in the Winter Herring Fishery, 1958), by Sverre Mollestad, article, Fiskets Gang, vol. 45, no. 11, March 12, 1959, pp. 166-174, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

NUTRITION:

Food Facts Talk Back (Food Information - Fallacies and Facts), 32 pp., illus., printed, 50 cents. The American Dietetic Association, 620 No. Michigan Ave., Chicago 11, Ill., June 1957. An attractive booklet which describes a dietetically-sound daily food plan, fallacies about foods and nutrition, misconceptions about weight reduction, food myths -- pregnancy and lactation, and reliable sources of information. Contains reference to the food fallacies pertaining to fish and shellfish. The authors assert that: "The statement that the combination of fish and milk is poisonous no doubt originated in days before refrigeration, when, by coincidence, people who were eating fish that was not strictly fresh also happened to be drinking milk at the same meal. People who refuse to eat fish and drink milk today probably never think of it as inconsistent when they eat fish chowder or oyster stew made with milk, or fish with cream

sauce. If two foods can be eaten separately, they can also be used in combination without harm."

OCEANOGRAPHY:

Effect of Water Clarity on Albacore Catches," by G. I. Murphy, article, Limnology and Oceanography, vol. 4, no. 1, January 1959, pp. 86-93, printed. Limnology and Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Mass.

Oceanographic Papers in Japan-1873-1938 (annotated Bibliography), 239 pp., printed. Japanese National Commission for Unesco, Tokyo, Japan, March 1957.

Oceanographic Papers in Japan--1939-1957 (annotated Bibliography), 223 pp., printed. Japanese National Commission for UNESCO, Tokyo, Japan, March 1958.

OYSTERS:

The Rise and Decline of the Olympia Oyster, by Earl N. Steele, 142 pp., illus., printed. Fulco Publications, Box 37, Elma, Wash., 1957. This book covers more than 50 years of the lives of the pioneer oystermen of Puget Sound, and the part they took in the development of the native oyster found in the waters of southern Puget Sound. It also describes how, after perfecting a superior system of oyster culture, which yielded abundant crops, they developed a market which readily utilized the supply. The causes of the decline of the industry are discussed in some detail.

PACKAGING:

Food Packaging Materials, Their Composition and Uses, Publication 645, 53 pp., printed. National Academy of Sciences--National Research Council, Washington 25, D. C., 1958. The objective of this study is to aid in evaluating the importance of current practices in the food trades from the standpoint of public health and developing principles for selection of components for use in food packaging. The report discusses characteristics and uses of different types of food packaging and of materials used in food packaging. Also among the subjects covered are plasticizers, stabilizers, antioxidants, release agents, adhesives, printing inks, etc. Included in the booklet is a list of chemicals used in making packaging materials.

"Pouch Packaging on Upswing," article, Frosted Food Field, vol. 27, October 1958, pp. 34-36, printed. Frosted Food Field, Inc., 321 Broadway, New York 7, N. Y.

PAKISTAN:

Annual Report of the Directorate of Fisheries, East Pakistan, for the Year Ending March 31, 1957, 151 pp., illus., printed. East Pakistan Government Press, Dacca, East Pakistan, 1958. Describes the work of the Directorate of Fisheries during 1956/57. Contains, among others, sections on Administration of the Protection and Conservation of Fish Act, 1950; production and development of fish farms, reclamation of derelict water areas, nurseryfish farms, introduction of exotic fish, and

research on control of aquatic vegetation; and shrimp culture. Short-term projects were approved for transport of fish in the district of Sylhet, mechanization of fishing vessels, expansion of net factory, "grow more fish" campaign, and procurement of fishing supplies for needy fishermen. The activities of the Technology Section fall under two major heads--laboratory research and investigations, and operation of pilot projects. The report also presents statistical tables covering quantities of fish exported, processed, and transported by species and districts; average wholesale and retail prices for various species and types of fish; and number of fishermen and vessels in relation to quantity of fish landed in various districts.

PEARL FISHERY:

"La Aventura de las Perlas" (The Pearling Adventure), by Carlos Aguero Gomez, article, El Agricultor Venezolano, vol. 22, no. 204, November-December 1958, pp. 6-9, illus., printed in Spanish. El Agricultor Venezolano, Information Section, Ministry of Agriculture and Breeding, Caracas, Venezuela.

PEARL SHELL:

Pearl Shell Investigation in the Cook Islands," by J. L. Noakes, article, South Pacific Commission Quarterly Bulletin, vol. 9, no. 1, January 1959, pp. 22-24, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

PILCHARDS:

The Biology of the South African Pilchard (SAR-DINOPS OCELLATA), by D. H. Davies, Investigational Report No. 32, 10 pp., illus., printed. (Reprinted from Commerce and Industry, December 1957.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1957.

PLAICE:

"Zur Beziehung Zwischen Bestandsdichte und Wachstum in der Schollenbevolkerung der Deutschen Bucht" (With Reference to the Consistency and Growth of the Plaice Populations of the German Bight), by Gotthilf Hempel, article, Berichte der Deutschen Wissenschaftlichen Kommission fur Meeresforschung, Neue Folge, band XV, heft 2, 1958, pp. 132-144, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart, Germany.

PLANKTON:

Measurements of Primary Production in the Sea (Contributions to Plankton Symposium, 1957), articles, Rapport et Proces-Verbaux des Reunions, vol. 144, 158 pp., illus., printed in English and French, Kr. 30 (about US\$4.35). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark, April 1958.

PORTUGAL:

Gremio dos Armadores da Pesca da Sardinha, Relatorio e Contas do Exercicio de 1958 e Orcamento para 1959 (Sardine Vessel Owners' Guild, Statement of Operations for 1957 and Budget for 1958), 22 pp., illus., printed in Portuguese. Comissao Revisora de Contas, Lisbon, Portugal.

PRESERVATION:

"Preservation (by Acidification) of Fish Waste Products and Poor-Quality Fish," by L. L. Lagunov, L. N. Egorova, N. I. Rekhina, and M. N. Eremeeva, article, Rybnoe Khoziaistvo, vol. 32, no. 9, 1956, pp. 78-83, printed. Ministerstvo Rybnoi Promyshlennosti SSSR, Kotel'nicheskaia Naberezhiaia D 1/15, Moscow, Zh-240, U. S. S. R.

"Preservation of Fresh Fish," by H. L. A. Tarr, article, Archiv fur Fischereiwissenschaft, vol. 8, 1957, pp. 9-21, printed. Gustav Wenzel & Sohn, Braunschweig, Germany.

PROMOTION:

"Development of National and International Cooperative Campaigns for Consumer Education on Fish," by O. Hanssen, article, Norsk Fryserinaering, vol. 10, no. 7-8, 1958, pp. 1-15, printed in Norwegian. Norsk Fryserinaering, Primsemsgate no. 6, Oslo, Norway.

RED TIDE:

"Some Biochemical Aspects of Red Tides and Related Oceanographic Problems," by Albert Collier, article, Limnology and Oceanography, vol. 3, no. 1, 1958, pp. 33-39, printed. Woods Hole Oceanographic Institution, Woods Hole, Mass.

REFRIGERATED SEA WATER:

"Transport and Storage of Fish in Refrigerated Sea Water," by H. L. A. Tarr and J. S. M. Harrison, article, Annual Review and Program, Fisheries Council of Canada, April 1957, pp. 35, 37, 39, 41, printed. Fisheries Council of Canada, Ottawa, Canada.

REFRIGERATION:

"International Survey on Refrigeration Equipment and Activities, 1957," section, Bulletin de l'Institut International du Froid, vol. 39, no. 1, 1959, pp. 213-312, printed in French and English. Institut International du Froid, 177 Boulevard Malesherbes, Paris (17^e), France. The first part of the results of a general survey of refrigeration activities in various countries made in 1958.

"Preserving the Catch with Refrigerated Sea Water," by S. W. Roach and J. S. M. Harrison, article, World Fishing, vol. 8, no. 4, April 1959, pp. 88-89, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London N. W. 1, England. The authors describe a 45-ft. steel vessel, launched in British Columbia in 1958, which was designed to utilize the refrigerated sea-water method of fish preservation but which can also hold fish in the conventional manner. The vessel is primarily a salmon troller but is easily adaptable to halibut long-lining, trawling, or crabbing. Refrigeration is supplied by a high-speed automotive-type compressor, belt-driven by the main engine.

SALMON:

On the Dynamics of Abundance of the Sockeye
Salmon (ONCORHYNCHUS NERKA Walb.), by
F. V. Krogius, Fisheries Research Board of
Canada, Translation Series No. 101, 16 pp.,
illus., processed. (Translated from Izvestiia
Tikhookeanskovo Nauchno-Issledovatelskovo Instituta Rybnovo Khoziaistva i Okeanografii, vol.
35, 1951, pp. 1-16, Vladivostok.) Fisheries Research Board of Canada, Biological Station,
Nanaimo, B. C., Canada, 1957.

"The Future of the Atlantic Salmon," article, Trade News, vol. 11, no. 8, February 1959, pp. 3-6, illus., processed. Department of Fisheries, Ottawa, Canada. The Atlantic salmon, in its fight for survival in Canada, has caught the imagination of many people in recent years. Concern for its well-being extends beyond the ranks of Canadian federal and provincial fisheries administrators and biologists and commercial and sport fishermen. This was made evident by interest shown in two recent speeches given by Canadian officials at annual meetings of associations of sport fishermen -- one in Boston and the other in Montreal. It was pointed out, in the first speech, that the Canadian Fisheries Department recognizes that the number of sport fishermen is increasing but that the salmon stocks could be managed to provide both a commercial and sport fishery, with certain regulatory restrictions. The salmon can still be found, in varying numbers, in about 300 eastern Canadian rivers and streams but in many of them the runs are small. The evidence still shows that the decline in salmon stocks is continuing. However, the Fish Culture Development Branch of the Canadian Department of Fisheries and the Fisheries Research Board's biological stations, at St. Andrews, New Brunswick, and St. John's, Newfoundland, have for some time given a high priority to all matters pertaining to the Atlantic salmon fisheries. So has the Marine Biological Station of the Quebec Department of Fisheries.

On the Production of Young Sockeye Salmon (ON-CORHYNCHUS NERKA Walb.), by F. V. Krogius and E. M. Krokhin, Fisheries Research Board of Canada, Translation Series No. 109, 30 pp., illus., processed. (Translated from Izvestiia Tikhookeanskovo Nauchno-Issledovatelskovo Instituta Rybnovo Khoziaistva i Okeanografii, vol. 28, pp. 3-27.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Qualitative Characteristics of the Stocks and the Dynamics of Abundance of the Autumn Chum Salmon of the Amur River, by I. B. Birman, Fisheries Research Board of Canada, Translation Series No. 103, 16 pp., illus., processed. (Translated from Izvestiia Tikhookeanskovo Nauchno-Issledovatelskovo Instituta Rybnovo Khoziaistva i Okeanografii, vol. 35, 1951, pp. 17-31, Vladivostok.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

"Rapid Learning of a Constant Course by Travelling Schools of Juvenile Pacific Salmon," by William S. Hoar, article, Journal of the Fisheries Research Board of Canada, vol. 15, no. 2, 1958, pp. 251-274, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Return of Silver Salmon, Oncorhynchus kisutch (Walbaum), to Point of Release," by Lauren R. Donaldson and George H. Allen, paper, Transactions of the American Fisheries Society (Eighty-Seventh Annual Meeting, 1957), pp. 13-22, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Colins, Colo., 1958.

Salmon of the Pacific Northwest: Fish vs. Dams, by Anthony Netboy, 134 pp., illus., printed. Binsfords & Mort, Portland, Ore., 1958.

"Some Effects of Artificial Light on Salmon Eggs Larvae," by Ronald Eisler, Paper, Transactions of the American Fisheries Society (Eighty-Seventh Annual Meeting, 1957), pp. 151-162, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo., 1958.

SARDINES:

Etude Intensive d'une Aire de la Ponte de la Sardine (SARDINA PILCHARDUS Walb.) en Adriatique Moyenne en 1950/1951 (Intensive Study of a Sardine Spawning Area in the open waters of the Adriatic Sea in 1950/1951), by T. Gamulin and J. Karlovac, Acta Adriatica, vol. 8, no. 3, 1956, 46 pp., illus., printed in French. Institute of Oceanography and Fisheries, Split, Yugoslavia.

"Frozen Sardines," by M. Boury, Revue des Travaux de l'Institut des Peches Maritimes, vol. 22, no. 3, September 1958, pp. 255-289, illus., printed in French. Institut Scientific et Technique des Peche Maritime, 59 Avenue Raymond-Poincare, Paris 16, France. A detailed account of tests on the freezing of sardines and on the processing of frozen sardines.

Investigations on the Larvae and Postlarvae of the Sardine (SARDINA PILCHARDUS Walb.) in the Open Waters of the Adriatic Sea (M. V. Hvar Cruises, Researches into Fisheries Biology, 1948/1949), by J. Karlovac, Reports, vol. 4, no. 4D, 23 pp., illus., printed in English. Institute of Oceanography and Fisheries, Split, Yugoslavia.

Preliminarna Opazanja o Srdeli (SARDINA PIL-CHARDUS Walb.) Sa Zapadne Obale Istre (Preliminary Observations on Sardine from the West Coast of Istra), by R. Muzinic, Acta Adriatica, vol. 8, no. 11, 5 pp., illus., printed in Serbo-Croatian with English summary. Institute of Oceanography and Fisheries, Split, Yugoslavia, 1958.

Prilog Izucavanju Odnosa Srdele (SARDINA PIL-CHARDUS Walb.) i Njezine Sredine (A Contribution to the Investigation of Relations of Sardine

to the Environment), by R. Muzinic, Acta Adriatica, vol. 8, no. 10, 18 pp., illus., printed in Serbo-Croatian with English summary. Institute of Oceanography and Fisheries, Split, Yugoslavia, 1958.

SCALLOPS:

Scallop Recipes, 5 cards, printed. New Bedford
Seafood Council, 60 No. Water St., New Bedford,
Mass. Recipes for large quantities--45-50
servings.

SHAD:

"Age and Growth of the American Shad, from three Atlantic Coast Rivers," by Donald F. La-Pointe, paper, Transactions of The American Fisheries Society (Eighty-Seventh Annual Meeting, 1957), pp. 139-150, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo., 1958.

SHELLFISH:

Sanitary Criteria for Shellfish by Species and by Area, by Robert L. Dow, 7 pp., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 48, 1958, pp. 23-29.) Department of Sea and Shore Fisheries, Augusta, Me. Recommendations to establish shellfish sanitary criteria by species and areas were approved by the National Shellfish Sanitation Conference in 1954 on the basis of laboratory and field observations and experiments reported by the author. To implement these recommendations (1) further studies were conducted in Maine to evaluate the relative importance of hydrographic, geological, and biological factors having actual or potential influence on the sanitary qualities of shellfish growing areas, and (2) cooperative experiments among the several northeastern states (Maine, Massachusetts, Rhode Island, Connecticut, and New York) have been carried on to establish standards for blue mussel (Mytilus edulis) and soft clam (Mya arenaria) shell stock.

SHRIMP:

"Australian Prawn Trawling Industry's Promising Future," article, World Fishing, vol. 7, no. 30, October 1958, p. 31, printed. John Trundell, Ltd., St. Richard's House, Eversholt Street, London, N. W. 1, England.

"Convention With Cuba for Conservation of Shrimp," article, The Department of State Bulletin, vol. 50, no. 1034 (Publication 6807), pp. 566-569, printed, single copy 25 cents. Public Services Division, Bureau of Public Affairs, U. S. Department of State, Washington 25, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C.) Contains the text of the convention between the United States of America and Cuba for the conservation of shrimp, signed at Havana on August 15, 1958; the report of the Acting Secretary of State; and a message of transmittal by the President to the United States Senate.

TAGGING:

"An Inexpensive Easily Constructed Fish-Marking Tag," by Fergus J. O'Rourke, article, Nature,

vol. 181, no. 4608, 1958, p. 577, printed. St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.

A Preliminary Review of Pertinent Past Tagging Investigations on Pink Salmon and Proposal for a Co-ordinated Research Program for 1959, Report No. 1, 47 pp., illus., processed. International Pacific Salmon Fisheries Commission, P. O. Box 30, New Westminster, B. C., Canada, June 1958.

THAWING:

"The Thawing of Blocks of Small Fish," by S. Gakicko, K. Penskaja, V. Borodin, and A. Bornovalova, article, Kholodil'naia Tekhnika, no. 3, 1958, pp. 39-44, illus., printed in Russian. (For sale at Four Continent Book Corp., 38 W. 58th St., New York 19, N. Y.)

TRADE LIST:

The Commercial Intelligence Division, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 each.

Oils (Animal, Fish, and Vegetable)--Importers,
Dealers, Producers, Refiners, and Exporters,
Paraguay (April 1959). Lists the name and
address, size of firm, and type of product handled by each firm. Includes firms dealing in
fish oils.

TUNA:

"Keeping Quality and Cold Storage of Albacores Caught off French Western Africa," by J. R. Crepey, article, Revue des Travaux de l'Institut des Peches Maritimes, vol. 22, no. 3, September 1958, pp. 291-301, illus., printed in French. Institut Scientific et Technique des Peche Maritime, 59 Avenue Raymond-Poincare, Paris 16, France.

"Tuna Meat Pigment Studies," by J. J. Naughton, M. M. Frodyma, and H. Zeitlin, article, Agricultural and Food Chemistry, vol. 6, no. 12, December 1958, pp. 933-938, printed. American Chemical Society, 1801 K St., NW., Washington, D. C.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 7, no. 4, April 1959, illus., printed in Turkish with English table of contents. Yeni Valde Han. Kat 5, Yeni Postane Karsisi, Istanbul, Turkey. Contains among others, the following articles: "The Activities of the Hydrobiological Research Institute" (Part II), by Recai Ermin--reports on studies of mullets (Mugil), bluefish (Pomatomus saltator), horse mackerel (Trachurus), shrimp, lobster, hydrography, the causes of the red tide in Izmir, and the pollution of the Golden Horn; "Tuna in Turkish Sea Waters and Its Catch" (Part II), by Ilham Artuz; "Sarda sarda and its Catch" (Part II), by Sitki Uner; and "About the Technical Problems of our Fish Canning Industry" (Part III), by A. Baki Ugur.

UNION OF SOUTH AFRICA:

Fourteenth Annual Report, Fisheries Development Corporation of South Africa Limited (Covering Period 1st October, 1957, to 30th September, 1958), 20 pp., illus., printed in English and Afrikaans. Fisheries Development Corporation of South Africa, Ltd., Sea-Fare House, 68 Orange St., Cape Town, Union of South Africa. Presents brief reports on the state of South Africa's fisheries; and research and general activities of the Corporation, including the rendering of assistance to the Department of Fisheries, Thailand.

WASHINGTON:

Report of Operations, 1958 (Fisheries Research Institute, University of Washington), 29 pp.,

illus., printed. College of Fisheries, Seattle 5, Wash., March 1959. Contains sections on the history of the Fisheries Research Institute, the fisheries of Alaska, Alaska salmon industry projects, and summary of Federal contract projects. Details are presented on red salmon studies at Nushagak and Chignik; pink salmon studies at Kodiak and in southeastern Alaska; high seas salmon tagging; salmon tagging in Cook Inlet and Prince William Sound; salmon tagging off the west coast of Prince of Wales Island; Kvichak red salmon studies; effects of logging on the productivity of pink salmon streams in Alaska; sea lion studies; stream catalog of southeastern Alaska; and king crab studies.



JAPANESE OYSTER ON UNITED STATES PACIFIC COAST

The Japanese oyster, Ostrea gigas, was originally imported to the United States Pacific Coast from Japan during the 1920's. It now supports a sizable industry in British Columbia and the state of Washington. The Japanese oyster is one of the largest in the world; it can attain a length of more than a foot, although the average length is less than this. The waters of the Northwest, while similar to its native waters, are somewhat colder. For this reason, the animal does not spawn every year, and seed (young oysters) must be imported from Japan.

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, Helen Joswick, and Vera Eggleston

* * * * *

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OUTDOOR FISH COOKERY

It's no secret that during the summer months cooking is moved outdoors. Thousands of supermarkets will promote "Cook-Out U. S. A." with special displays, recipes, posters, and pennants.

Nine American fish "Cook-Outs," filmed to reflect the heritage and tradition of the areas portrayed, are shown in a new sound-color, 16 mm. film released by the Bureau of Commercial Fisheries, U. S. Department of the Interior.



Designed to intrigue those who cook outdoors—either in the open spaces or in their own backyards—the film is the 16th in a series of fishery educational motion pictures produced by the Bureau. All are available to interested groups on a free loan basis. The "Outdoor Fish Cookery" film requires 28 minutes and has been cleared for public service television.

BARBECUED FISH STEAKS

- 2 pounds salmon steaks or other fish steaks, fresh or frozen
- 2 tablespoons salt
- 1 cup water
- 1 cup catsup
- cup salad oil
- 3 tablespoons lemon juice
- 2 tablespoons vinegar

- 2 tablespoons hickory liquid smoke
- 1 teaspoon Worcestershire sauce
- 1 teaspoon salt
- $\frac{1}{2}$ teaspoon grated onion
- 1 teaspoon powdered mustard
- † teaspoon paprika
- 1 clove garlic, finely chopped
- 3 drops tabasco

Thaw frozen steaks. Cut into serving-size portions. Add salt to water. Soak fish in brine for 3 minutes. Turn and soak other side for 3 minutes. Drain. Combine remaining ingredients and blend thoroughly. Marinate fish in sauce for 30 minutes. Place fish in well-greased hinged grills. Grill over moderately hot coals for 7 to 10 minutes or until lightly browned around the edges. Baste with sauce. Turn and brush with remaining sauce. Grill for 5 minutes longer or until fish flakes easily when tested with a fork. Serves 6.

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BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF INDUSTRIAL RESEARCH

AND SERVICES

HAROLD E. CROWTHER, CHIEF



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

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CONSTRUCTION AND CATCH SELECTIVITY OF ALBACORE GILL NETS USED IN THE CENTRAL NORTH PACIFIC

By Joseph J. Graham* and Herbert J. Mann**

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INTRODUCTION

A comprehensive study of the resources of the albacore tuna, Germo alalunga (Bonnaterre), north and northeast of the Hawaiian Island chain under Public Laws 329 and 466 (the latter known as the Saltonstall-Kennedy Act) has been made by the Pa-

cific Oceanic Fisheries Investigations (POFI) of the U. S. Bureau of Commercial Fisheries. One of the important objectives of the study has been to uncover concentrations of albacore of commercial magnitude. It is likely such a concentration was brought to light by cruises in 1955 and 1956 (fig. 1).

The principal gear that made this discovery possible was the gill net, and events leading up to its use by POFI in the North Pacific began in 1955. During the summer of that year, the POFI research vessel Hugh M. Smith (cruise 30) surveyed the central North Pacific (fig. 1) with vessels of Pacific Salmon Investigations (PSI) of the U. S. Fish

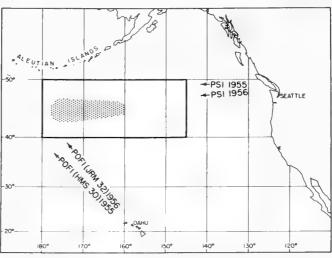


Fig. 1 - Outline of the general region surveyed during 1955 and 1956 by Pacific Oceanic Fishery Investigations and Pacific Salmon Investigations. The area of albacore concentrations is shaded.

and Wildlife Service (Powell and Peterson 1957). The Hugh M. Smith conducted hydrographic stations while determining the distribution and abundance of albacore tuna with trolling gear. The PSI vessels attempted to delineate the distribution of highseas salmon by gill-netting at night. Catches of albacore on the trolling gear were mediocre. However, albacore were taken in the salmon gill nets at the more southern stations (48° N.-45° N.) of the PSI vessels. A few of those catches were impressive, particularly since most of the fish were not gilled, but entangled in the small-meshed salmon nets 1/2. The following year, during the same period and in the same area, the POFI research vessel John R. Manning made a fishing survey (cruise 32) in cooperation with PSI. Gill-netting was extended farther south (43° N.) by POFI where a greater abundance of albacore was anticipated and larger mesh sizes more suitable for albacore were used. Again albacore were found concentrated in about the same area, and were taken in that vessel's gill nets in near-commercial quantities.

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** Fishery Methods & Equipment Specialist

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^{1/} Personal communication to Director, POFI, Honolulu, T.H., from Chief, Pacific Salmon Investigations, Seattle, Wash., September 20, 1955.

TYPE OF GEAR USED

The gill nets fished by POFI were of a design currently in use in the salmon fishery of the northwest coast of America. In addition, trammel nets designed specifically by POFI gear specialists for albacore fishing were utilized. The construction details of both types of nets are shown in figure 2. A unit of gear, the

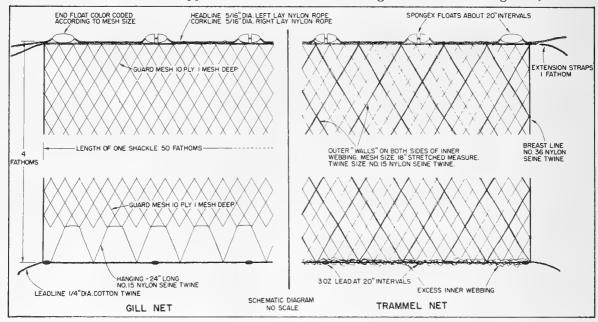


Fig. 2 - Construction details of POFI albacore nets.

shackle, measured 50 fathoms in length and about 4 fathoms in depth regardless of mesh size. A set at a gill-net station was composed of 12 shackles of gill net and 2 shackles of trammel net joined together. The mesh sizes of the gill-net shackles

	Та	ıble 1 - Gill-	Net Specifications	
Mesh Size (Stretched)	Depth (Number of Meshes)	Twine Size (Ply)	Guard Mesh (Size and Ply)	Type Hanging (Leadline)
$4\frac{1}{2}$	71	5	1 mesh-10 ply, 1 mesh-8 ply	2 mesh/hanging, skip 1
5111	59	5	11	11
$6\frac{1}{2}$ "	51	6	11	11
7111	45	8	11	2 mesh/hanging, skip 0

were $4\frac{1}{2}$ inches, $5\frac{1}{2}$ inches, $6\frac{1}{2}$ inches, and $7\frac{1}{2}$ inches (stretched mesh). Construction details of the gill-net and trammel-net shackles are summarized in tables 1 and 2, respectively. Nets were hung in a conventional manner with the webbing 50 percent

	Table 2 – Trammel-Net Specifications													
	Inner Net Outer Net													
Mesh Size (Stretched)	Depth (Number of Meshes)	Twine Size (Ply)	Mesh Size (Stretched)	Depth (Number of Meshes)	Twine Size (Number)									
4 12 11	124	5	18"	20	15									
6 111	86	6	19"	19	15									

on the corkline so that 100 fathoms of netting (stretched mesh) were hung on 50 fathoms of corkline. Trammel nets differed from the gill nets in the addition of largemesh outer "walls," which enclosed the inner webbing. These outer walls of webbing were evenly spaced opposite to each other to allow fish to push the inner webbing through the walls and thus pocket themselves.

Except for the leadline, the nets were made of nylon, and dyed green or greygreen to make them less conspicuous in the water. The webbing was constructed of bonded double-knotted salmon twine, headlines and corklines of 3-strand spun rope, and breastlines, seizings, and hangings of spun twine.

SELECTIVITY OF MESH SIZE

The manner in which albacore were captured during the summer cruise of the John R. Manning was not the same for the various meshes of a set. Smaller meshes

of the gill nets captured fish more by entangling than gilling and the trammel meshes captured entirely by entangling rather than pocketing.
When a set of nets was retrieved, the tension placed on the shackle coming aboard was

	Table 3 - The Number of Fish Lost per Mesh Size of Gill Net as the Retrieved Gear											
Neared the Vessel (The figures in parentheses give the loss per shackle.)												
(The figures	in parenthese	es give the los	s per shackle.)								
Mesh $4\frac{1}{2}$ $5\frac{1}{2}$ $6\frac{1}{2}$ $7\frac{1}{2}$												
Number Lost.	7(0.21)	11(0.25)	5(0.09)	1(0.03)								

sufficient to disentangle the fish and those not properly gilled sometimes fell out of the net before reaching the vessel. Table 3 indicates that more fish were lost from

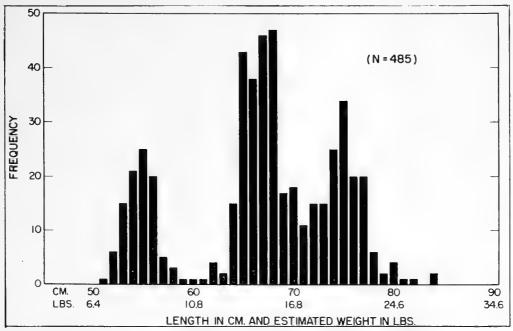


Fig. 3 - Length frequencies and estimated weight of albacore tuna taken in gill nets during cruise 32 of the research vessel John R. Manning.

the smaller meshes than from the nets of larger meshes during retrieving. The absence of fish loss from the trammel mesh probably attests to the entangling efficiency of its multiple meshes.

Three size groups of albacore covering a size range of 51 cm. (20 inches) to 84 cm. (33 inches) fork length (fig. 3) were sampled by the gill nets of the John R. Manning. Table 4 shows that over this size range a progressive shift toward larger

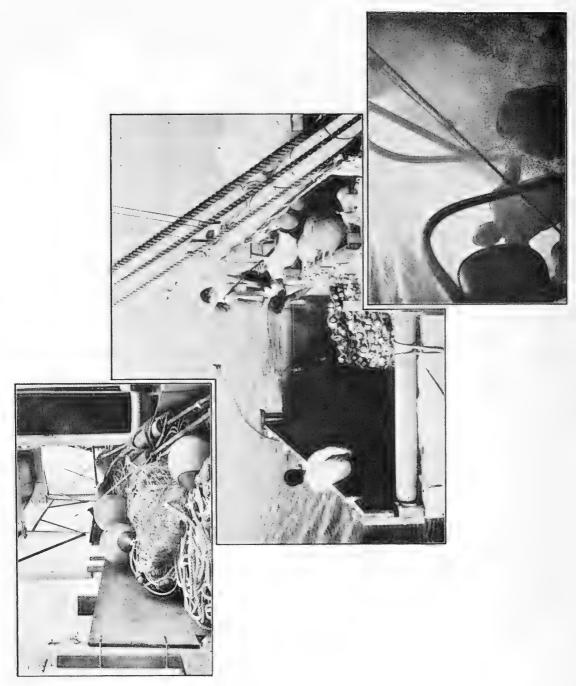


Fig. 4 - Upper lett panel: Gill nets stacked in the bins of the charter vessel Paragon. Middle panel: Laying gill nets, John R. Manning. Bottom panel: Retrieving gill nets in the North Pacific, John R. Manning.

fish accompanied an increase in mesh sizes from $5\frac{1}{2}$ inches to $7\frac{1}{2}$ inches. This shift was so great in the case of the largest mesh that the small size group (51-60 cm. or 20-23 inches) was almost missing from the catch. In contrast, the smallest mesh $(4\frac{1}{2}$ inches) captured fish from all three size groups sampled (51-60 cm. or 20-23 inches, 61-70 cm. or 24-28 inches, and 71-80 cm. or 28-31 inches) and small fish were not emphasized in the catch. As in the case of the trammel nets it appeared that the $4\frac{1}{2}$ -inch mesh captured albacore entirely by entangling.

	Table 4 - Length Frequency of Albacore per Mesh Size																																		
Shackel		Fork Length in cm. 51[52[53]54[55]56[57]58[59]60]61[62[63]64[65]66[67]68[69]70]71[72]73[74]75[76]77[78]79[80]81[82]83]84														Totals																			
Diracite.	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	TOTALS
$4\frac{1}{2}$	-	-	1	3	2	6	-	-	-	1	-	-	-	2	5	8	4	3	4	-	1	_	1	3	3	5	3	1	_	-	-	_	-	1	57
5 <u>1</u>	-	6	10	8	7	4	2	1		-	-	1	1	2	5	-	6	8	3	2	2	2	1	4	5	-	3	_	_	-	-	-	-	-	83
6 1/2	1	-	2	9	14	6	3	2	-	E	1	3	-	7	19	18	21	16	6	11	6	4	4	4	12	6	4	1	-	2	-	-	-	-	182
7 1/2	_	_	-	-	1	-	-	-		-	-	-	1	3	10	8	12	19	3	5	2	6	7	5	8	5	8	3	2	2	-	_	-	1	111
Trammel	-	-	2	1	1	4	-		1	_	_	_	_	1	3	4	3	1	1	-	_	3	2	7	5	4	2	1	-	_	1	_	-	-	47
Totals	1	6	15	21	25	20	5	3	1	1	1	4	2.	15	42	38	46	47	17	18	11	15	15	23	33	20	20	6	2	4	1	-	-	2	480

The progressive shift in fish size with increase in mesh size and the ability of the larger meshes to gill rather than entangle affect the commercial potentialities of the individual meshes. Of the meshes fished, the $7\frac{1}{2}$ inch stands far above the others in efficiency in catch when measured both by numbers and by weight of fish caught per shackle (table 5). This efficiency is further emphazised in that average

	Table 5 - Catch per Mesh Size Within the Area of Abundance (42°-46° N., 175°-155° W.) (Figures in Parentheses were Determined from the Four Largest Catches. 1/2)													
Mesh Size														
(Stretched Measure)	Measure) Number Shackle Shackle Fish Above 10 Lbs. Shackle													
4 1 11	(35) 57	(4.4) 2.0	855	(61) 30	15 11	79	57	1.9						
5 1 11	(48) 84	(4.8) 2.2	1,054	(56) 28	12 12 11	54	57	1.4						
6 1 11	$6\frac{1}{2}$! (105) 186 (8.0) 3.7 2,642 (110) 56 $14\frac{1}{2}$! 80 56 1.1													
7 1 11	(78) 118	(9.8) 4.2	1,929	(172) 69	17 1 11	99	22	0.7						
Trammel	Trammel (25) 47 (5.0) 2.8 773 (78) 45 $16\frac{1}{2}$ 80 28 1.6													
1/ Included	1/ Included in all figures is the catch for a set which took 10 albacore, but had a soaking time of only $2\frac{1}{2}$ hours.													

fish size is greater for this mesh and almost all fish taken exceeded 10 pounds. Below this size albacore are often not acceptable to canners. Another attractive feature of the larger mesh is a lower shark catch per shackle, for while shark damage to albacore during the cruise was negligible, their removal from the nets required time and resulted in broken meshes. Presumably, the larger mesh of the $7\frac{1}{2}$ -inch net permitted the slender form of the great blue Prionace glauca (Linnaeus)--the most abundant shark--to pass through rather than gill in the net.

On the basis of the above data, it is not possible to establish what mesh size would be best for fishing albacore commercially with gill nets in the central North Pacific, since our most efficient mesh was also the largest used. Powell et al (1952) captured albacore of the same size range in the eastern North Pacific using gill nets with mesh sizes of $7\frac{1}{2}$ inches, $8\frac{1}{2}$ inches, and $9\frac{1}{2}$ inches. His data showed that the $7\frac{1}{2}$ -inch and $8\frac{1}{2}$ -inch meshes fished with about the same success but the $9\frac{1}{2}$ -inch mesh experienced a considerable decrease in catch. From Powell's and our own observations we conclude that the most efficient mesh size with respect to commercial gain would lie between $7\frac{1}{2}$ inches and $8\frac{1}{2}$ inches.

As the gill net was retrieved aboard the John R. Manning, an observer recorded the depth of each albacore in the net by arbitrarily dividing the total depth of the

net (by sight) into thirds. A summary of these observations showed that during the cruise, 41 percent of the catch was taken in the upper third of the net, 35 percent in the middle, and 24 percent in the lower third. Thus, most of the fish were captured near the top of the net, but the one quarter near the bottom would suggest that if the net had been deeper, more fish might have been taken. Powell et al (1952) also recorded the depth distribution of fish in their nets and found that the majority of the albacore were taken near the surface between 1 and 3 fathoms in depth, that is, within the depth (4 fathoms) of the POFI nets. However, several fish were captured near the leadline and it is possible that in some instances the 100-mesh nets, which are about twice the depth of the POFI nets, did not fish the entire vertical distribution of albacore. The depth of net from which the greatest commercial advantage could be realized cannot be ascertained from the above data since such factors as cost of netting, ease of retrieving, net storage area aboard the vessel, etc., must be considered. Without such considerations, a compromise between the gears used by Powell and POFI or 75 meshes would not seem unreasonable.

SUMMARY

If we consider our data comparable with that of Powell, the most productive net with which to fish albacore commercially in the central North Pacific would have a mesh size between $7\frac{1}{2}$ inches and $8\frac{1}{2}$ inches and a depth of 75 meshes.

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LITHUANIAN FISHERMEN TESTING ELECTRICAL FISHING IN BALTIC

Lithuanian fishermen are testing an electrical fishing method in the Baltic in which fish are caught by electrifying patches of water. Special electrodes connected to a generator aboard the fishing vessel are lowered into the water. When current flows between them, fish within several dozen yards of the anode are attracted towards it and when sufficient fish have congregated, they are pumped by a powerful pump to the deck of the vessel. Only bigger fish are attracted and one such installation is stated to be able to service 7 trawlers at the same time (Fisheries Newsletter, July 1958).

NUTRITIONAL VALUES OF FISH-MEAL PROTEINS AND THEIR RELATION TO PROCESSING VARIABLES

By C. R. Grau,* Neva L. Karrick,**
B. D. Lundholm,*** and R. N. Barnes****

ABSTRACT

More than 100 commercial and experimental fish meals were evaluated as sole sources of amino acids in chick diets in an attempt to determine what variables, if any, influence the protein quality of fish meal. It was found that the quality is influenced by the temperature of drying and possibly by storage conditions of the meal and by moisture-plus-oil content of the meal.

INTRODUCTION

Many attempts have been made to relate quality of protein to variation in processing methods in the manufacture of fish meal. It is generally thought that spoilage, extremely high temperatures, or long times of drying and other similar treatments reduced quality. That no simple relationships are involved, however, is clear

from the extensive older literature and from a recent survey (Grau and Williams 1955).

The purpose of the present study therefore was to attempt to discover what processing variables, if any, are related to the nutritional value of the protein in fish meal.

PROCEDURE

The general approach to the problem was to study meals produced from one species of fish during one year, note processing variables of possible significance, determine composition of meals, estimate protein quality of the meals by measurement of the growth of chicks, and then study the data to see if there was correlation between the processing variables and quality.

The data taken included the following: date of capture of fish, condition of raw material, method of drying the press cake, type of meal produced, when sample was taken, and proximate composition of the meal. The effects of time and temperature of storage on the nutritive value of the meals also were studied.

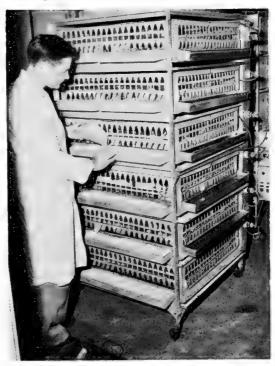


Fig. 1 - Battery brooder at the Poultry Husbandry Department, University of California. Chicks are being raised prior to feeding an experimental diet to study protein quality of fish meals.

MEAL SAMPLES: The fish meals used in the present work were obtained by the U.S. Bureau of Commercial Fisheries largely from commercial plants located along the Atlantic Coast and the Gulf of Mexico. Most of the meals were made from whole menhaden (Brevoortia tyrannus), but two samples of haddock (Melanogrammus aeglefinus) fillet waste and two of rosefish (Sebastodes marinus) fillet waste from

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New England also were included. Nearly all of the meals were from regular commercial sources, but a few (X-series) were produced experimentally in equipment

of pilot-plant size that had been leased by the Bureau.

Table 1 - Composition of the Diets										
Component	Level in Diet									
	Percent									
Mineral, choline, and glucose mixture (see below)	10									
Vitamin mixture (see below)	6									
Soybean oil, crude	5									
Protein , crude, from fish meal	20									
Glucose, to a total of	100									
Calaine share dibasis mixture:	2 20									
Calcium phosphate, dibasic	3.30 1.92									
Calcium carbonate	0.6									
Magnesium sulfate · 7 H ₂ 0	0.6									
Potassium chloride	0.5									
Sodium silicate 9 H ₂ 0	0.3									
Aluminum sulfate • 18 H ₂ 0	0.1									
Farric citrate	0.074									
Ferric citrate Manganous sulfate • H ₂ 0	0.03									
Zinc sulfate • 7 H ₂ 0	0.0063									
Copper sulfate (anhydrous).	0.005									
Cobaltous acetate • 4 H ₂ 0	0.002									
Choline chloride	0.20									
Glucose to make a total of	10.00									
Vitamin mixture:										
Vitamin A premix (1,000 IU per gram)	0.1									
Vitamin D premix (1,500 ICU per gram)	0.1									
Vitamin E premix (1 mg. per gram) (440 IU per gram)										
Nicotinic acid	0.006									
Calcium (d) pantothenate	0.003									
Thiamine HCl	0.001									
Riboflavin	0.001									
Pyridoxin HCl	0.001									
Folic acid	0.001									
Menadione	0.001									
Biotin	0.00001									
Vitamin B ₁₂	0.0000022									
Glucose to make a total of 1/ The level of fish meal used is determined by the cru	6,00									
11/ The level of fish meal used is determined by the cru	de protein									
(N x 6.25) content; thus, if the meal contained 60										
tein, the level of meal would be $20 \times 100 = 33.3$ p	ercent.									
60										

DETERMINATION OF PRO-TEIN QUALITY: A number of different methods of estimating • the quality of protein have been developed; the method of choice for any particular product depends on the use to which the data are to be put (Grau and Carroll 1958). In earlier studies of fish meals (Grau and Williams 1955), a protein source supplied all the amino acids in a diet that otherwise was composed of purified materials. In this method, all nutrients except amino acids are contained in the basal diet. This method has the advantage that it yields rapid results and indicates deficiencies or imbalances of amino acids, but it has the disadvantages of not differentiating among meals that supply various amounts of amino acids above the required levels and of rating as poor those proteins that may be deficient in one or two amino acids but that could supply amino acids needed to supplement other proteins. A

more accurate measure of quality could be obtained by estimating the amount of each amino acid that is available to the animal from a particular source of protein. Such a measure now is being developed, but work on it had not been started when this investigation was undertaken; hence the more general method of assessing quality was employed.

The chick-growth method used to determine quality of protein in the fish meals was as follows: Newlyhatched white leghorn chicks were fed a commercial-type starter mash for 11 days, and then the heaviest and lightest birds (about 10 percent) were discarded. The remaining birds were placed

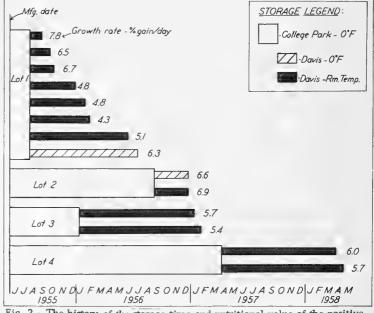


Fig. 2 - The history of the storage time and nutritional value of the positive control menhaden meal, GG1-3A65.

at random into converted rat cages that housed four birds each. Four such

GCG2=287S	Table 2 - Data on Samples												
EBA (haddock)	Code1/		of Raw				Protein	Oil	Ash	Moisture	Growth Rate		
EBA (haddock) 1953-54 G+ HAA								(Per	cent)				
EBB (haddock) 1953.5-4 G+	EBA (haddock)										7.8		
GG3-B775					FS								
GCG-IB7S GOI-6C65 GOI	GG3-3D75		G		FS	l i							
GG1-GC656 GG1-Weight (resetting) GG1-Weight (GG1-1B75		G										
GG1-12875			F										
CGG-1:BTS	GH1 (rosefish)		G			1							
GG2-1875	GG4-1B75					1							
GGB-2B75 7/13 G			G										
CP70	GG8-2B75		Ğ										
Section	GG11-3D115D		1										
CPSO			1										
CH3 (haddock) 9/28	CP50		1								6.9		
GGS-2B7S	GG4-2B75				CS								
CGG-2875 7/13 G D CD EG 63.0 11.4 16.7 7.0 6.8 CGC-2875 7/13 G D CS EG 61.1 10.4 20.2 7.3 6.7 CH2 (rosefish) 9/15 - HA 58.2 9.0 25.9 7.1 6.7 CH2 (rosefish) 9/15 - HA 58.2 9.0 25.9 7.1 6.7 CGG-2876 7/13 G D CD BG 63.1 10.9 16.7 7.2 6.6 CGG-3-2875 7/13 G D CD BG 63.1 10.9 16.7 7.2 6.6 CGG-3-2875 7/13 G D CD BG 63.1 10.9 16.7 7.2 6.6 CGG-3-2875 10/4 G HA CM - 60.3 8.6 C2.8 7.7 6.6 CGG-3-2875 10/18 C D FS - 61.1 3.8 19.6 11.6 6.5 CGG-3-2875 10/18 C D FS - 61.1 3.8 19.6 11.6 6.5 CGG-3-2875 11/2 - S CS - 64.3 9.8 19.1 6.6 C.5 CGG-11-3D115F 11/2 - S CS - 64.3 9.8 19.1 6.4 6.4 6.4 CGI1-3D115F 11/2 - S CS - 64.3 9.8 19.1 6.6 C.5 CGG-3-285 8/24 E S FS - 58.2 11.2 20.1 8.9 6.3 CGG-3-285 8/24 E S FS - 62.1 19.2 20.1 8.9 6.3 CGG-3-285 8/24 E S FS - 62.1 19.2 20.1 8.9 6.3 CGG-3-285 8/24 E S FS - 62.1 19.2 20.5 9.6 6.3 CGG-3-285 8/24 E S FS - 60.2 19.2 20.5 9.6 6.3 CGG-3-285 8/24 E S FS - 58.0 11.0 22.6 7.1 6.3 CGC24-105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 CGC24-105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 CGC2-3-285 8/24 E S FS - 58.4 9.8 21.6 8.0 6.2 CGG-3-285 8/24 E S FS - 58.4 9.8 21.6 8.0 6.2 CGG-3-285 8/24 E S FS - 58.4 9.8 21.6 8.0 6.2 CGG-3-285 8/24 E S FS - 58.4 9.8 21.6 8.0 6.2 CGC2-2-305 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 CGC2-3-285 8/24 E S FS H G2.6 9.8 20.4 8.9 6.2 CGG-3-285 8/24 E S FS H G2.6 9.8 20.4 8.9 6.2 CGG-3-285 8/21 G HA FS FC G0.2 8.6 22.3 9.9 CGC-2-385 8/31 G HA FS FC G0.2 8.0 2.3 5.9 S G.2 CGC2-385 8/31 G HA FS FC G0.4 7.8 2.3 5.9 S G.2 CGC2-385 8/31 G HA FS FC G0.4 7.1 8.4 21.5 8.9 G.2 CGG-3-385 8/31 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/31 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/31 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/31 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/31 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21.0 8.4 6.1 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21.0 8.6 CGG-3-385 8/30 G HA FS FC G0.7 8.2 21													
GC7-2875	GG6-2B75		G	D	CD	EG					6.8		
GG3-2B75	GG7-2B75		1		CS								
GG31-3D115B					CD								
GCG27-3A105	GG32-3A105					-							
GCG1-3D115F 11/2	GG11-3D115B	11/2				1							
GGI-1-3D1ISC 11/2 - S CS - 64.3 9.8 19.1 6.4 6.4 6.4 CP71 10/26/54 C S FS - 64.5 10.3 16.2 8.6 6.4 CP71 10/26/54 C S FS - 64.5 10.3 16.2 8.6 6.4 CP71 10/26/54 C S FS - 58.2 11.0 20.1 8.9 6.3 CGS-3D8S 8/24					1								
GG11-3D1ISC 11/2 - S CS - 64.5 10.3 16.2 8.6 6.4 CP71 10/26/54 G S FS FS - 58.2 11.2 20.1 8.9 6.3 CGS-3D8S 8/24 E S FS FS FC 62.1 9.2 20.5 9.6 6.3 CGS-3D8S 8/30 G S FS FS FC 62.1 9.2 20.5 9.6 6.3 CGS-3D8S 8/30 G S FS FS FC 62.1 9.2 20.5 9.6 6.3 CGS-3D105 10/18 F S CM - 63.5 11.4 18.5 6.9 6.3 CGS-3D105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 CGS-4D125 12/9 F HA FS FC 60.2 8.6 22.3 7.4 6.3 CGS-4D125 12/9 F HA FS FC 60.2 8.6 22.3 7.4 6.3 CGS-3D8S 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 CGS-3D8S 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 CGS-3D8S 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 CGS-3D8S 8/31 G HA CM - 61.1 8.4 21.5 8.9 6.2 CGS-3D8S 8/31 G HA CM - 61.1 8.4 21.5 8.9 6.2 CGS-3D8S 8/31 G HA FS FC 60.2 8.6 20.3 7.4 6.1 CGS-3D8S 8/31 G HA FS FC 60.2 8.4 20.5 8.9 6.2 CGS-3D8S 8/31 G HA FS FC 60.2 8.4 20.5 8.9 6.2 CGS-3D8S 8/31 G HA CM - 61.1 8.4 21.5 8.9 6.2 CGS-3D8S 8/31 G HA FS FC 60.2 8.4 20.1 8.9 6.2 CGS-3D8S 8/31 G HA FS FC 60.7 8.2 21.0 8.4 6.1 CGS-3D8S 8/30 G HA FS FC 60.7 8.2 21.0 8.4 6.1 CGS-3D8S 8/30 G HA FS FC 60.4 7.8 23.4 9.0 6.1 CGS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 CGCS-3D8S 8/30 G HA FS FC 60.4 7.9 20.0 11.5 5.9 GCCS-3D8S 8/30 G HA FS FC 60.4 7.9 20.0 11.5 5.9 GCCS-3D8S 8/30 G HA FS FC 60.0 11.8 19.7 7.0 5.8			1										
GGS-3D8S 8/24 E S FS FC 62.1 9.2 20.5 9.6 6.3 GGS-3D8S 8/30 G S FS H 63.6 9.2 17.5 11.6 6.3 GGS-3D8D 10/18 F S CM - 63.5 11.4 18.5 6.9 6.3 GGS-3D105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 GGS-4D105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 GGS-4D105 10/18 G D FS - 58.0 11.0 22.6 7.1 6.3 GGS-3D105 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 GGS-3D8S 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 GGS-3D8S 8/24 E S FS H 62.6 9.8 20.4 8.9 6.2 GGS-3D105 10/18 G D FS - 57.5 9.7 23.4 7.9 6.2 GGS-3D105 10/18 G D FS - 57.5 9.7 23.4 7.9 6.2 GGS-3D105 10/18 G D FS - 57.5 9.7 23.4 7.9 6.2 GGS-3D105 10/20 G HA CM - 61.1 8.4 21.5 8.9 6.2 GGS-3D105 10/20 G HA CM - 61.1 8.4 21.5 8.9 6.2 GGS-3D105 10/20 G HA FS FC 60.7 8.2 21.0 8.4 6.1 GGS-3D105 10/20 G HA FS FC 60.7 8.2 21.0 8.4 6.1 GGS-3D105 10/20 G HA FS FC 60.7 8.2 21.0 8.4 6.1 GGS-3D105 10/20 G HA FS FC 60.8 9.1 21.0 8.7 6.1 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.4 9.0 6.1 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.4 9.0 6.1 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GGS-3D105 10/20 G HA FS FC 60.4 7.9 24.0 7.6 5.9 GGS-3D105 10/20 G HA FS FC 60.4 7.9 24.0 7.6 5.9 GGS-3D105 10/20 G D FS - 60.4 7.9 24.0 7.6 5.9 GGS-3D105 10/20 G D FS - 61.0 8.7 9.1 1.5 5.9 GGS-3D105 10/20 G D FS - 60.4 7.9 9.2 1.1 6.7 5.9 GGS-3D105 10/20 G D FS - 60.4 7.9 9.2 1.1 7.9 7.5 5.9 GGS-3D105 10/20 G D FS - 60.6 11.0 8.7 9.1 1.5 5.9 5.9 GGS-3D105 1	GG11-3D115G	11/2	-	S	CS		64.5	10.3	16.2	8.6	6.4		
GGG-3D8S	CP71												
GG9-3D105		1											
GGI5-4D125 12/9 F	GG9-3D105	10/18	F	S	CM	ł .	63.5	11.4	18.5	6.9	6.3		
CP73 6/16 GC3-3D85 8/24 E S FS HA FS - 62.6 G9.8 20.4 8.9 6.2 GG11-3A95 8/31 G HA FS FC S4.5 9.8 20.4 8.9 6.2 GG11-3A95 8/31 G HA FS FC S4.5 9.8 20.4 8.9 6.2 GG33-3A105 10/20 G HA CM - 61.1 8.4 21.5 8.9 6.2 GG33-3A95 8/31 G HA CM - 60.7 60.7 60.2 GG22-3A05 10/18 G HA FS FC 60.7 8.2 21.0 8.4 6.1 8.9 6.2 GG33-3A95 8/31 G HA CM - 60.7 10/20 C HA CM - 60.7 10/20 C HA FS FC 60.7 8.2 21.0 8.4 6.1 6.1 6.1 6.2 60.1 6.2 GG33-3A95 9/27 G HA FS FC 60.7 8.2 21.0 8.4 6.1 6.1 6.1 6.1 6.2 GG22-3A05 10/18 G HA FS FC 60.7 8.2 21.0 8.4 6.1 6.1 6.1 6.2 GG22-3A05 10/18 G HA FS FC 60.8 8.9 1.2 1.0 8.7 6.1 GG23-3A05 8/30 G HA FS FC 60.8 9.7 21.3 9.9 6.0 61.2 GG3-3A05 8/30 G HA FS FC 60.8 9.7 21.3 9.9 6.0 60.6 GG3-3A05 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GG4-3D85 8/30 G HA FS FC 60.4 7.8 23.2 7.8 6.0 GG4-3A85 8/30 G HA FS FC 60.1 60.2 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.3 60.4 60.4 7.8 80.9 7.8 60.0 60.	GGX24-105												
GG3-3D85													
GGX22-105	GG3-3D85	8/24	E	S	FS		62.6	9.8	20.4	8.9	6.2		
GG33-3A105			G			1							
GC13-3A95			G			ł.							
GC29-3A105	GG13-3A95	8/31	G					9.5					
GG31-3A105													
GG12-3A95	GG31-3A105												
GG4-3D85	GG12-3A95	8/30	G					9.7					
GG7-3A85			G										
GG8-3A85	GG7-3A85		G										
GG23-3A95	GG8-3A85												
GGX27-105						_							
GC9-3A8S 8/31 G HA FS H 61.3 9.3 18.6 10.5 5.8 GCX11-95 9/28 G HA FS - 55.6 11.0 25.1 7.0 5.8 GC22-3A95 9/29 G HA FS FC 61.0 7.9 22.0 8.6 5.8 GC26-3A105 10/11 G HA FS FC 58.6 9.5 21.7 9.1 5.8 GC4-4D115 11/2 - HA FS FC 62.0 9.6 20.3 6.5 5.8 GG1-3B85 8/31 G HA FS H 59.4 9.4 18.5 12.7 5.7 GGX5-95 9/13 E HA FS - 57.4 10.1 22.9 8.6 5.7 GGX12-95 9/29 G HA FS - 59.7 9.3 21.7 8.7 5.7	GGX27-105	10/20	G	D	FS		61.0	8.7	21.1	6.7	5.9		
GGX11-95	GG2-3D65		G										
GC22-3A95 9/29 G HA FS FC 61.0 7.9 22.0 8.6 5.8 GC26-3A105 10/11 G HA FS FC 58.6 9.5 21.7 9.1 5.8 GC36-3A105 11/2 - HA FS FC 62.0 9.6 20.3 6.5 5.8 GG1-3B85 8/31 G HA FS H 59.4 9.4 18.5 12.7 5.7 GCX5-95 9/13 E HA FS - 57.4 10.1 22.9 8.6 5.7 GG10-1B95 9/21 G S FS FC 65.5 12.6 15.2 5.9 5.7 GGX12-95 9/29 G HA FS - 59.7 9.3 21.7 8.7 5.7 GGX21-105 10/13 G HA FS - 58.1 9.6 21.6 8.9 5.7 GG21-3C105 10/26 G HA FS - 58.1 9.6 21.6 8.9 5.7 GG6-4D115 11/7 G HA FS FC 62.7 13.4 14.7 7.6 5.7 GG10-3A85 8/31 G HA FS H 62.2 9.3 17.5 10.5 5.6 GG1-3A95 9/8 - HA CM - 62.8 7.1 22.8 7.4 5.6 GGX18-105 10/11 G HA FS - 59.3 14.0 18.6 7.1 5.6 GG24-3A105 10/4 G HA FS FC 58.6 9.1 22.9 8.6 5.5 GG18-3A95 9/13 E HA FS FC 61.1 9.4 21.6 7.2 5.4	GGY11-95	9/28	G				55.6	11.0			5.8		
GG4-4D115	GG22-3A95	9/29	G	HA	FS	FC	61.0	7.9	22.0	8.6	5.8		
GG1-3B85													
GGX5-95 9/13 E HA FS - 57.4 10.1 22.9 8.6 5.7 GG10-1B95 9/21 G S FS FC 65.5 12.6 15.2 5.9 5.7 GGX12-95 9/29 G HA FS - 59.7 9.3 21.7 8.7 5.7 GGX21-105 10/13 G HA FS - 58.1 9.6 21.6 8.9 5.7 GGX21-105 10/26 G HA FS - 60.6 11.8 19.7 7.6 5.7 GG6-4D115 11/7 G HA FS FC 62.7 13.4 14.7 7.6 5.7 GG10-3A85 8/31 G HA FS H 62.2 9.3 17.5 10.5 5.6 GG3-3B85 8/31 G HA FS FC 58.6 9.3 18.6 13.2 5.6 GG17-3A95 9/8 - HA CM - 62.8 7.1 22.8 7.4 5.6 GGX18-105 10/11 G HA FS - 59.3 14.0 18.6 7.1 5.6 GG24-3A105 10/4 G HA FS FC 58.6 9.1 22.9 8.6 5.5 GG18-3A95 9/13 E HA FS FC 61.1 9.4 21.6 7.2 5.4	GG1-3B85		G										
GGX21-105	GGX5-95	9/13	E	HA	FS	-	57.4	10.1	22.9	8.6	5.7		
GGX21-105			G			FC							
GG1-3C105	GGX12-93 GGX21-105		G			-	1		21.6	8.9	5.7		
GG3-3B85	GG1-3C105	10/26	G			-	60.6	11.8					
GG3-3B85			G										
GG17-3A95 9/8 - HA CM - 62.8 7.1 22.8 7.4 5.6 GGX18-105 10/11 G HA FS - 59.3 14.0 18.6 7.1 5.6 GG24-3A105 10/4 G HA FS FC 58.6 9.1 22.9 8.6 5.5 GG12-4D115 10/27 F HA CS - 62.9 8.5 20.9 7.0 5.5 GG18-3A95 9/13 E HA FS FC 61.1 9.4 21.6 7.2 5.4	GG10-3A85 GG3-3B85		Ğ						18.6	13.2	5.6		
GG24-3A105	GG17-3A95	9/8	-	HA	CM		62.8	7.1	22.8	7.4	5.6		
GG12-4D115 10/27 F HA CS - 62.9 8.5 20.9 7.0 5.5 GG18-3A95 9/13 E HA FS FC 61.1 9.4 21.6 7.2 5.4	GGX18-105		G			FC							
GG18-3A95 9/13 E HA FS FC 61.1 9.4 21.6 7.2 5.4	GG12-4D115		F	HA	CS	-					5.5		
Continued on next page.	GG18-3A95	9/13		<u> </u> HA	FS	FC	61.1	9.4	21.6		5.4		

Table 2 - Data on Samples (Contd.)										
Code1/	Catch Date <u>2</u> /	Condition of Raw Material3/	Drying Method <u>4</u> /	Meal Type <u>5</u> /	Samples Taken <u>6</u> /	Protein	Oil	Ash	Moisture	Growth Rate
						(Percent)				Percent Gain Per Day
GG5-3A85	8/24	S	HA	FS	FC	53.6	11.1	24.9	10.2	5.3
GGX10-95	9/27	G	HA	FS	-	60.7	8.7	21.5	8.3	5.3
GG21-3A95	9/28	G	HA	FS	FC	59.2	7.9	24.8	7.9	5.3
GG30-3A105	10/18	G G	HA	CM	-	61.3	9.9	19.8	8.3	5.3
GG10-3D105	10/26	G	S	FS	-	65.2	9.5	19.4	6.3	5.3
GG11-3D115	11/2	-	S	CS	-	65.3	9.6	19.2	5,5	5.3
GG5-4D115	11/2	-	HA	CS	-	62.2	10.2	19.8	6.9	5.3
GG8-3D95	8/30	G	S	CM	-	63.0	9.7	19.1	9.1	5.2
GG19-3A95	9/21	_	HA	FS	FC	62.0	9.1	20.4	7.4	5.2
GGX16-105	10/6	G	HA	FS	-	57.5	9.8	24.2	7.9	5.2
GG4-3A85	8/24	S S G	HA.	FS	H	55.0	10.1	24.8	9.3	5.1
GG6-3A85	8/22	S	HA	CM	-	60.5	12.5	20.3	7.5	4.9
GGX6-95	9/14	G	HA.	FS	-	59.1	8.5	21.9	8.7	4.9
GG4-3B95	8/31	G	HA	CM	-	59.3	11.3	19.8	11.2	4.8
GG16-3A95	9/7	-	HA	CM	-	62.6	7.3	21.8	7.7	4.7
GGX15-105	10/6	G F	HA	FS	-	56.1	12.2	23.0	6.8	4.5
GG18-4D125	12/9	F	HA	CS	-	60.2	7.5	23,3	6.9	4.4
GGX19-105	10/12	G	HA	FS	-	54.7	11.4	25.1	7.8	4.3
GG13-4D115	11/7	G	HA	CM	-	62.9	13.4	14.8	7.2	4.3
GG14-4D115	11/9	-	HA	CM	1 -	64.3	13.0	14.7	6.4	4.3
GG19-4D125	11/16	E	HA	CM		62.9	11.7	17.1	6.5	4.2
GG28-3A105	10/14	Ģ	HA	FS	FC	58.9	12.2	20.2	8.1	4.1
GG11-4D115	11/9	-	HA	FS	FC	65.0	13.5	14.7	5.5	4.1
GG3-3A85	8/24	S	HA	FS	H	53.6	12.3	27.0	8.6	3.9
GGX20~105	10/12	G	HA.	FS	-	57.0	10.4	23.2	8.3	3.9
GGX14-105	10/4	G	HA	FS	-	55.2	16.2	22.1	6.1	3.4

1/ All meals processed from menhaden, unless noted otherwise.

2/ Catch date-all fish caught during 1955 unless marked otherwise.

3/ Condition of raw material-E - excellent, G - good, F - fresh, S - spoiled.

4/ Drying method--S - steam drier, HA - hot-air drier, D - dehydromat drier.

5/ Meal type--FS - fresh scrap, CS - cured scrap, CM - cured meal, CD - cured dust.

6/ Samples taken--FC - floor cooled two hours, H - hot, bagged immediately, BG - beginning of grinding, EG - end of grinding.

groups were randomized in racks in a room maintained at about 85° F. Twelve hours of artificial light was available each day.

The chicks were fed diets that contained the ingredients listed in table 1. The level of fish meal was adjusted to provide 20 percent crude protein to each diet. Feed and water always were available to the birds. The test period lasted 8 days, and the rate of growth was expressed as the percent gain per day. This value was calculated for each group by dividing the gain per day by the average of the initial and final weights and then multiplying by 100.

RESULTS AND DISCUSSION

The data for the chick-feeding tests are presented in table 2, together with proximate analyses and a condensed history of the fish-meal samples. The rate of growth varied from 7.8-percent gain per day for meals of highest quality down to 3.4-percent gain per day for those of lowest quality.

An examination of the data shows two trends. Both the drying method employed during manufacture of the meal and the composition of the meal affected its nutritive value.

The fish meals were prepared in driers of several types: in hot-air driers at high temperature and in steam driers and dehydromat driers at lower temperature.

In table 3, growth rates are tabulated according to the method of drying. All of the 15 meals that were of poor quality and resulted in low-growth rate were dried at high temperature, whereas 76 percent of the meals of good quality were dried at low temperature. These results indicate that high-temperature drying is associated with decreasing quality of the meals. They also indicate, however, that meals of good quality can be prepared in high-temperature driers. Accordingly, there must

be factors other than temperature that affect meal quality.

Table 3 – Comparison of Protein Quality as Measured by Growth Rate and of Temperature Used to Dry Meals						
Growth Rate Low Temperature High Temperature						
Percent Gain per Day		Percent	No. of Meals	Percent		
6.5 to 7.8 (good)	19	76	6	24		
5.1 to 6.4 (intermediate) 16 28 41 72						
3.4 to 5.0 (poor)	0	0	15	100		

Materials making up fish

meals are liquids (moisture and oil) and solids (protein and ash). The content of moisture plus oil, which gives a measure of the liquid-type constituents, has been used in table 4 as a means of classifying the meals. A comparison of the meals in

Table 4 - Comparison of Protein Quality and of Amounts of Moisture-Plus-Oil Contents						
Growth Rate			Moisture-Plus-C			
Glowal Rate					19.0 to 26.9	
Percent Gain Per Day	No. of Meals	Percent	No. of Meals	Percent	No. of Meals	Percent
6.5 to 7.8 (good)	10	38	13	50	3	12
5.1 to 6.4 (intermediate)						
3.4 to 5.0 (poor)	2	13	3	20	10	67

three categories of moisture-plus-oil content with the meal quality is shown in table 4. Meals low in moisture plus oil tend to fall in the group yielding good growth rate (38 percent in the good category as compared to only 13 percent in the poor category). Meals having high moisture plus oil tend to fall in the group yielding poor growth rate (67 percent in the poor-growth-rate group as compared to only 12 percent in the high-growth-rate group). There thus seems to be some correlation between the composition of the meal as measured by moisture plus oil and the growth rate.

A number of other possible correlations were investigated including those of growth rate with condition of raw material from which the meal was made, with protein content, with ash content, and with meal type, but no clear-cut trends could be found.

When the menhaden meals were manufactured, one carefully processed lot was set aside as a control. Samples of this meal (GG1-3A65) were kept at unregulated

Table 5 - Effect of Storage on Protein Quality of Fish Meals							
Code	Initial Value	Storage Time	Value Aft	ter Storage			
Code	Percent Gain Per Day	Months	Percent G	ain Pe. Day			
			0° F.	85° F.			
GG2-2B75	7.6*	2*	6.7*	6.0*			
GG1-1B75	7.5*	2*	7.1*	6.2*			
GG3~3D75	7.5	7	6.9	6.2			
GG5-1B75	7.4	7	5.9	5,9			
GG4-1B75	7.3	7	6.7	5.3			
GG1-6C65	7.3	7	6.1	6.7			
GG1-2B75	7.3*	2*	6.7*	6.9*			
GG2-1B75	7.1	7	6.9	6.4			
GG8-2B75	7.1	7	7.0	5.2			
CP70	7.0	7	6.7	7.0			
GG4-2B75	6.9	7	6.8	5.3			
GG6-2B75	6.8	7	7.0	5.9			
GG5-2B75	6.8*	2*	6.6*	6.9*			
GG7-2B75	6.7	7	7.1	6.1			
GG3-2B75	6.6	7	5.3	5.1			
CP71	6.3	7	6.1	5.9			
CP73	5.2	7	5.7	5.5			
Average	6.9	7*	6.5*	5.9*			
*Two-mont	hs storage; omitted fro	m average.					

room temperature or at 0° F. in closed fiberboard drums until used for biological tests. The first tests, in which the meal was used as a positive control, revealed it to be an excellent source of protein. During the succeeding months, however, the quality decreased, as is shown in figure 1.

During the course of this research, four different lots of the standard menhaden meal (GG1-3A65) were used. The growth results with these four lots are shown in figure 2, together with data on time, temperature, and place of storage.

Meals were not kept at 0°F. while being shipped from College Park, Md., to Davis, Calif. The results indicate that storage at unregulated room temperature was harmful to the first lot of meal. The other lots showed less adverse effect of storage, but those stored at room temperature were not as good as were those kept at 0°F. These data are only indicative, but they do suggest the advisability of testing further the effects of storage temperature on quality.

The possible adverse effects of storage on protein quality were studied directly by taking a series of meals that had been stored at 0°F. from the time of manufacture in June 1955 until June 1956, when the samples were divided. One-half of each sample was stored at 0°F.; and the second half, at a temperature of 85°F. Four of these pairs were fed after 2 months; the others, after 7 months. The growth results, which are presented in table 5, show that although some of the meals deteriorated at the elevated temperature, others either were not changed in value or, even after having deteriorated, contained protein of higher quality than the diet required. More critical tests are needed to establish the nature of the observed effect.

CONCLUSIONS

- 1. The results of using a large series of fish meals as the sole source of amino acids in chick diets revealed a variation in protein quality.
- 2. A correlation has been shown between higher drying temperature used in manufacturing meals and a lowering of protein quality, as measured by growth rate of chicks fed these meals; but other factors must be important because some meals dried at high temperature were of good quality.
- 3. There appears to be some correlation between growth rate of chicks and composition of meals as measured by moisture-plus-oil content. This indication needs further study.
- 4. There also appears to be a correlation between protein quality and the duration and temperature at which the meal was stored after manufacture. Again, this possible correlation must be confirmed by additional work before it can be considered as being definitely established.

SUMMARY

More than 100 fish meals were studied as sole sources of amino acids in chick diets in an attempt to determine if variables during processing are related to protein quality of the final product. For most of these variables, no correlation could be established. A relationship between drying temperature during the manufacture of the meal and the resulting growth rate when the meal was fed, however, was indicated. Some indication also was obtained that growth rate of fish meals may be related to meal-storage conditions after manufacture and also to the composition of the meal as measured by the moisture-plus-oil content.

Note: The continued interest and aid given this research by the State Feed Laboratory, California Department of Agriculture, is gratefully acknowledged. We are particularly indebted to Van P. Entwistle and the late William L. Hunter for the proximate analysis values reported.

Acknowledgment is also made to the staff of the College Park and Boston laboratories of the Bureau and particularly to Dr. Hugo Nilson for his collection and preparation of fish meal samples used in this study. M. E. Stansby of the Seattle Technological Laboratory furnished many helpful suggestions.

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CANNED TUNA QUALITY IMPROVEMENT STUDIES

In the production of canned tuna, it is agreed generally that the methods used in handling, chilling, freezing, and storing the fish aboard the tuna clippers and thawing aboard or in the plant affect the quality of the canned product. As a result of the tuna industry's need for more systematic knowledge of the many variables in freezing of tuna, the Bureau of Commercial Fisheries has awarded contracts for the past three year for research in the southern California fishery. The studies have been concerned primarily with the clipper-caught tuna which are caught far from shore and brine-frozen for delivery to the cannery. Both industry and experimental conditions have been used to determine the effect of time, temperature, and physical handling during chilling and freezing on the general acceptability and yield of the precooked tuna and the canned product. Much of this research has been concerned with the factors in salt absorption during brine-chilling and the subsequent thawing. Current studies include the changes related to bacterial growth during the chilling and thawing operations. As a result of these various research phases, recommendations for improved handling, freezing, and thawing methods are being developed in cooperation with the tuna industry.

As an adjunct to the contract studies, the Bureau's Technological Field Station in southern California has undertaken recently more exacting studies of the chemical composition of the tuna species and the relation to both vessel and plant process variables. Such knowledge of the changes in chemical constituents as protein, oil, salt, minerals, water-soluble vitamins, and objective freshness indices will eventually enable better quality control at each stage of preservation and plant process. Knowledge of these changes is important also to assess the effect of preservation and process improvements. Information on the content of nutritionally-important components of the fresh-caught tuna in relation to their content in the canned product is desirable to determine the effect of natural variations in quality.

At present these long-range composition studies include an initial project on the composition variables in fish of the same lot and species in relation to adequate sampling methods. The subsequent phase will consider the application of the laboratory methods for determining composition differences in the raw, precooked, and canned fish of the same lot.

CHEMICAL COMPOSITION OF PACIFIC COAST FISH AND SHELLFISH

The chemical composition of Pacific west coast marine fish is receiving major attention at the U. S. Bureau of Commercial Fisheries' Seattle Technological Laboratory. Much of the work deals with proximate composition—the content of protein, oil, moisture, and ash.

One of the major projects in this program has been a recently completed twoyear study of the variations in proximate composition of halibut meat with regard to size of fish and different parts of the same fish. The proximate composition of tuna is now under study. The over-all plan involves determination of composition of different parts of light and dark meat in a variety of sizes with regard to species, area of capture, and season of capture. Preliminary work has been completed on albacore, skipjack, yellowfin, and bluefin tuna to determine the scope of the investigation. A more intensive study of albacore is now in progress.

Several species of rockfish and of sole are also under study. Attempts are being made to secure additional specimens in order to give adequate coverage for about 10 species each of rockfish and sole. When a series of pink salmon now on hand have been analyzed, the three-year study on this species will be terminated and a start will be made on silver salmon. Some work done on the proximate composition of Pacific cod will be continued as additional specimens representative of seasonal and area variables become available.

Work on the composition of fish meals has included proximate analysis, carbonate content, and digestibility of fish-meal protein as determined by the pepsin-digestion method. This work has been terminated and reports of the investigations are being prepared.

The sodium content of commercially frozen fish fillets and steaks is of special importance just now due to interest in low sodium diets. Some eastern processors dip the fillets and steaks in brine before freezing them. Very little brine dipping is used on the west coast. Commercially prepared samples of sole, halibut, silver salmon, cod, and ocean perch are being analyzed for sodium content. The samples include both fresh-water and brine-dipped products. Comparative results will be made available on completion of the analyses.



CONTROL OF DRIP IN CHILLED AND FROZEN FISHERY PRODUCTS

When frozen fishery products are thawed, drip in the form of a liquid exudes from the product. In most instances, this drip is lost or discarded. If the exudate is, in fact, fish protein this practice wastes food. Investigating the factors that affect the water retentivity of various frozen fishery products, to develop laboratory procedures for measuring drip, and to determine some of the constituents of drip are the objectives of a project assigned to the Seattle Fishery Biological Laboratory of the U. S. Bureau of Commercial Fisheries. This information will assist the industry to produce a uniform, high-quality fishery product retaining a maximum of the inherent goodness of the fish and provide information required in the setting up of standards or specifications for such fishery products. At present, the species studied is halibut.

The results of our studies indicate that drip or drained weight determinations are not entirely meaningful unless standard procedures for their determination are used. For example, higher drip content or lower drained weight may be obtained for a product by using a higher thawing temperature and/or longer thawing time. Because frozen fishery products are perishable when thawed, we are recommending that drip or drained weight determinations be made at a product temperature not exceeding 40° F.



FREEZING AND COLD STORAGE OF PACIFIC OYSTERS AND FRESH-WATER FISH

Research on the freezing and cold storage of Pacific oysters and fresh-water fish is being carried out cooperatively by the Seattle Fishery Technological Laboratory of the U. S. Bureau of Commercial Fisheries and the Refrigeration Research Foundation. The work for several years has included storage-life studies on various species of fresh-water fish from the Great Lakes and Central States areas, evaluation of antioxidants for extending the frozen storage life of Pacific oysters, and storage-life studies on Pacific oysters. Earlier reports have been published of work on fresh-water fish and on the application of antioxidants.

Currently, the research on Pacific oysters is being confined to methods of freezing. The major objective of this phase of the work is to produce an individually-frozen oyster. Two methods of freezing the oysters individually have been attempted; immersion in brine-glucose solutions of various concentrations, and blast freezing. Immersion-freezing proved unsatisfactory, due to salt pick-up by the oyster meats, and the development of rancidity during subsequent frozen storage. The blast-freezing method has been very successful when the frozen oysters were glazed with either ice, 2-percent corn sirup solids, or 1 percent ascorbic acid, prior to storage.

The blast-frozen oysters were placed separately on metal trays which were held in a blast freezer at -20° F. until the oysters were thoroughly frozen. The frozen oysters were removed from the trays and separated into 4 groups. One group was placed in polyethylene bags without further processing. The other three groups were glazed with either water, 1-percent ascorbic acid, or 2-percent corn sirup solids. Samples of each of these were then placed in polyethylene bags. Each bag contained approximately 3 dozen individual oysters. The bags of oysters were all stored in fiber cartons in a 0° F. room.

The group without a glaze deteriorated rapidly. After 4 months, dehydration and oxidation caused the samples to be judged on the borderline of acceptability. The ice-glazed, corn sirup solids-glazed, and ascorbic acid-glazed samples were in excellent condition up to 8 months of storage. After 10 months, the edges had begun to discolor, causing the meats to have slight off-flavors. However, the product was still edible.

These results indicate that individually blast-frozen oysters glazed with either ice, corn sirup solids, or ascorbic acid may have commercial value from the standpoint of ease of separation and storage life.

NEW PRODUCTS FROM FISH OILS

Marine oils have been used in the past for the manufacture of soaps, paints, and varnishes, shortenings, linoleum, and numerous miscellaneous nonfood products including lubricants and greases. During the past 20 years, the United States domestic market for marine oils has been declining. Partly as a result of increasing industrial research on competitive oils, such as linseed and soybean oils, marine oils have been used less and less. Also, certain undesirable characteristics, such as instability due to autoxidation and ease of rancidification, make marine oils less desirable as raw materials. At the same time, there are strong indications that the European export market, which at the present time consumes a major part of the United States production of marine oils for margarine manufacture, etc., may decline to the point where domestic markets would be unable to make up the difference in stabilizing present and future oil economies.

In an effort to help divert possible economic trouble that could jeopardize the future security of the United States marine-oil industry, the U. S. Bureau of Commercial Fisheries in 1953 began a limited-scale program of investigating the chemistry of marine oils. The principal aim in this early work was to carry out basic research on chemical syntheses involving the polyunsaturated fatty acids--so unique to marine oils--and report the findings to potential users (industrial labs, etc.). In 1954, this program got an added boost with the congressional approval of the Salton-stall-Kennedy Act. This law sets aside a portion of the funds derived from duties on imports of fish and fishery products to be used for the support of government research in behalf of the fishing industry.

At the Bureau's Fishery Technological Laboratory in Seattle, investigations of chemical syntheses involving fatty acids from marine oils have been and are continuing to be carried out. Some of the products of these syntheses include monoglycerides, amines, amides, quaternary ammonium salts, fatty alcohols, alkyl halides, epoxides, xanthates, and sodium alkyl sulfates. These products are unique to marine oils in that they are derived from fatty acids having 14 to 24 carbon atoms and from 0 to 6 ethylenic double bonds.

Several problems are associated with research on new products from marine oils. Air oxidation is the chief problem when handling polyunsaturated compounds. Owing to their high degree of unsaturation, the fatty acids and their derivatives are readily polymerizable in many organic reactions. Polymerization and decomposition reactions result in undesirable side-products that cause difficulty in the purification of many fatty-acid derivatives. Nitrogen is used continuously in our work as a means of providing an inert atmosphere. A centrifugal molecular still is often used to purify the liquid products. With this still, for example, it is possible to separate about a liter of products from polymeric substances in from two to three hours.

The problem of chemical reactivity is sometimes a determining factor as to the type of products obtainable from marine-oil fatty acids. For example, synthesis of alkyl halides from the corresponding fatty alcohols does not proceed in the clear-cut manner as for the lower members of the aliphatic series. Also, primary and secondary halogen atoms attached to \mathbf{C}_{18} to \mathbf{C}_{22} carbon-chain molecules have been found to be very slow to react and the yields far from theoretical.

Preliminary to much of the organic synthesis work, studies were carried out on methods of separating mixtures of long-chain polyunsaturated compounds. Separations by low-pressure fractional distillation are limited by the amount of decomposition and polymerization that can occur. Separations of these compounds are best carried out by low-temperature fractional crystallization and/or fractional crystallization of urea-inclusion compounds of the corresponding straight chain derivatives.

Another important activity of the marine-oil program at the Seattle Laboratory is the coordination of contract research with universities and other institutions on problems associated with the chemistry of marine oils. Presently, there are three basic and one applied research contracts actively being carried on. The three basic research programs under contract are at the Hormel Institute, University of Minnesota at Austin. These include (1) the determination of the structure and analysis of highly unsaturated fatty acids in marine oils, (2) the study of chemical reactions of marine-oil fatty acids, and (3) the study of the chemistry of the odor problem in marine oils. At the School of Mines and Metallurgy of the University of Minnesota, the applied research contract is carried out on the investigation of the utilization of marine-oil derivatives in ore flotation.

STUDIES ON CHEMICAL COMPOUNDS FORMED DURING SPOILAGE OF FISH

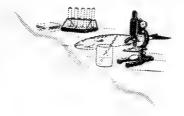
Bacterially-induced spoilage is the most important quality change that occurs in fresh fishery products. A number of interrelated factors together produce the conditions which lead to this quality change and at the present level of technological knowledge it is not possible to completely prevent this change.

The outer surfaces and intestinal tract of all live fish and shellfish are normally inhabited by the bacterial flora of their normal environment—the sea. After cap—ture, and death of the animal the natural defenses against bacteria are removed and the organisms multiply and gain access to the normally sterile tissues. During subsequent handling, until the product reaches the consumer, there are opportunities for additional bacterial contamination. It is not possible wholly to eliminate the conditions through which seafoods are contaminated, nor is there an economical method available to completely inhibit bacterial growth without altering the desirable fresh character of seafoods.

Practices such as careful evisceration, washing, careful handling of fish, use of clean ice, and washing and disinfection of holds, boxes, and other equipment have evolved through the years and have been very important in reducing the degree of contamination. Adequate icing and rapid distribution of fishery products have reduced the biochemical activities of the bacteria and the length of time that the organisms are in contract with the product before it reaches the consumer. The application of these practices has done much in reducing the rate of quality deterioration due to bacterial growth. However, these inovations have not eliminated bacterial deterioration and it still poses a serious problem.

In order to develop new practices that will further decrease the rate of bacterial growth in fishery products additional basic knowledge of the spoilage process is needed. Some of the aspects of this problem that merit attention are: (1) The nature and concentration of some of the lesser known compounds that are formed by bacteria in spoiling fish. (2) The evaluation of the resulting compounds in respect to their effect on flavor and odor of fish. (3) The study of the biochemical activities of some of the predominant groups of organisms that are found on spoiling fish.

At the Seattle Fishery Technological Laboratory of the U. S. Bureau of Commercial Fisheries, we are determining the content of compounds (metabolite) in fish resulting from bacterial activity. Efforts thus far have been mainly directed toward the development of analytical methods which will be used to estimate these metabolites in spoiling fish. In the future it is hoped that work can be started on the estimation of some of the lesser known metabolites such as the carbonyl compounds. It would also be interesting to evaluate the effect of some of the known bacterial metabolites, such as trimethylamine, formic acid, etc., on the flavor and odor of fish.



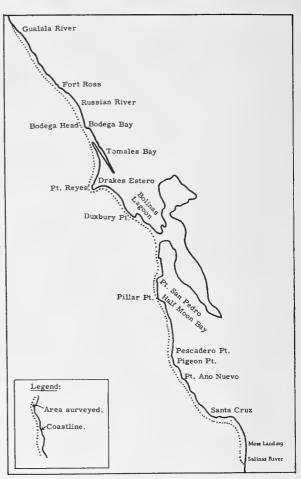


California

AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING CONTINUED (Airplane Spotting Flight 59-7): The inshore area between the Salinas River, Monterey County, to the Gualala River, Mendocino County, was surveyed from the air (April 25-26, 1959) by the California Department of Fish and Game Beechcraft and Cessna 180 to assess the numbers and distribution of clam diggers, abalone pickers, and hookand-line fishermen.

Rain squalls and fog prevented observations in the majority of the survey area on April 25 except the coastline from Half Moon Bay to Bolinas Bay. Here visual conditions were poor and assessment of fishermen was limited to estimates rather than actual counts.

The entire area was scouted on April 26 and a census was made of abalone pickers, clam diggers, shore fishermen, and pier fishermen. Tides of -1.3 on April 25 and -1.2 on April 26 favored fishing activities for clams and abalone during the morning hours. The largest number of clammers was in Monterey Bay where 470 pismo clammers were counted on April 26. Large groups of people were observed on both days in the area between Pillar Pt. and Pt. San Pedro. This is a popular area for educational field trips. However, some of the people listed were engaged in fishing for abalone.



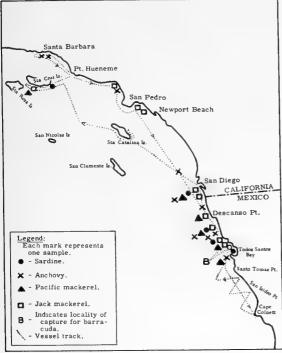
Flight Report of Beechcraft and Cessna 180 (59-7--April 25-26, 1959).

* * * * *

PELAGIC FISH AND BARRACUDA POPULA-TION SURVEY OFF COAST SOUTHERN CALIFOR-NIA AND NORTHERN BAJA CALIFORNIA (M/V Alaska Cruise 59-A-3 Pelagic Fish and Barracuda): The coast and islands of southern California and northern Baja California, from Cape Colnett north to Goleta, were surveyed (March 30-April 17, 1959) | (3) to collect live sardines for genetic studies being

by the California Department of Fish and Game's research vessel Alaska. The objectives were (1) to sample the spawning population of sardines off southern California and northern Baja California; (2) to assess the relative abundance of sardines, Pacific mackerel, jack mackerel, and anchovies;

conducted by the U. S. Fish and Wildlife Service, La Jolla; and (4) to refine barracuda tagging techniques prior to the 1959 sportfishing season by catching and tagging barracuda whenever possible and observing mortality and tag retention in the live-bait well.



M/V Alaska Cruise 59-A-3 (March 30-April 17, 1959).

A total of 76 night-light stations was occupied. At each station a 1,500-watt light and four 750-

watt auxiliary lights were used. All lights were illuminated for approximately one hour, where-upon the four auxiliary lights were extinguished and the 1,500-watt light dimmed. The blanket net was then set.

Only 18 of the night-light stations, or 24 percent, yielded one or more of the four pelagic species—sardines, Pacific mackerel, jack mackerel, and anchovies. Anchovies were sampled at 11 stations (14 percent), jack mackerel at 10 (13 percent), sardines at six (8 percent), and Pacific mackerel at six (8 percent).

A total of 472 miles were scouted at night between stations and 239 fish schools were observed-70 were identified as anchovies, 15 as saury, 4 as mackerel, and the remainder unidentified.

Although fish schools were plentiful in the survey area, night-light stations were not as productive of fish as on preceding cruises. The low yield of fish samples can be partly attributed to poor weather conditions. Rough seas in the northern Channel Island area prevented occupation of night light stations in areas where fish schools were visible. In many other areas the efficiency of the night lights was probably reduced by the roll of the vessel in choppy seas.

Ten barracuda were caught, tagged with loop tags, and placed in the live-bait well. Two of the barracuda (36 and 38 inches in length) were caught at Todos Santos Island, and eight (20 to 22 inches long) were caught off Ensenada. One of the smaller fish died and one tag was shed during the cruise. Death was probably due to injuries received from handling prior to gag application. The shed tag had been tied with a square knot rather than the standard double overhand knot.

The barracuda showed little interest or desire to feed upon the live anchovies periodically put in the bait well with them.



Canned Fish

CANNED FISH PURCHASES, APRIL 1959: Canned tuna purchases by household consumers in April 1959 were 847,000 cases of which 47,000 cases were imported. By type of pack, domestic-packed tuna purchases were 182,000 cases solid,509,000 cases chunk, and 109,000 cases grated or flakes. The average purchase was 1.3 cans at a time. About 28.1 percent of the households bought all types of canned tuna; only 1.7 percent bought the imported product. The average retail price paid for a 7-oz. can of domestic solid or fancy was 34.7 cents and for a $6\frac{1}{2}$ -oz, can of chunk 28.2 cents. Imported solid or fancy was bought at 30.6 cents a can. April purchases were slightly lower than the 879,000 cases bought in March by 3.6 percent; retail prices in most cases were slightly lower.

During April, household consumer purchases of California sardines were 55,000 cases; and 25,000 cases imported sardines. The average purchases was 1.9 cans at a time for California sardines and 1.7 cans for imported. Only 1.8 percent of the

households bought canned California sardines and 1.9 percent imported. The average retail price paid for a 1-lb. can of California sardines was 23.0 cents, and for a 4-oz. can of imported 25.6 cents. Retail prices were lower for both California and imported canned sardines. Because of the liberal stocks of canned California sardines, there has been a steady increase in purchases since October 1958.

Canned salmon purchases in April 1959 were 228,000 standard cases, of which 122,000 cases were pinks and 48,000 cases reds. The average purchase was 1.2 cans at a time. About 15.1 percent of the households bought all types of canned salmon; 7.6 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 55.9 cents and for red 84.8 cents. April purchases were down about 8.4 percent from the 249,000 cases bought in March.



Cans--Shipments for Fishery Products, January-April 1959



Total shipments of metal cans during January-April 1959 amounted to 29,964 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 29,888 tons in the same period a year ago. Canning of fishery products in January-April this year was confined largely to tuna and Gulf oysters. Increased shipments of metal cans during April this year as compared with the same month in 1958 and the preceding month were probably due to later-than-

normal stockpiling for the late spring and summer canning season.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factors 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries Investigations 1/

EXPERIMENTS ON THE ARTIFICIAL PROPAGATION OF TILAPIA FOR TUNA BAIT CONTINUE TO SHOW PROMISE: Experiments were carried out at the Honolulu Biological Laboratory of the U.S. Bureau of Commercial Fisheries to test a method for inducing early spawning in tilapia and to determine the growth of young tilapia in fresh water, brackish water (16 parts per thousand) and sea water (33 parts per thousand). These experiments in April are part of a series designed to determine the economic feasibility of rearing tilapia for use during skipjack live-bait fishing-as a supplement to the natural bait available to Hawaiian fishermen.

To induce early spawning, heating cables were used in two tanks, one with a plastic cover. During the late winter months, January through March, the fry production in the control tank (unheated) was 5,980, 13,777 in the tank with heater and cover, and 14,767 in the tank with only the heater. The temperatures in the covered tank were as much as 10° F. higher than the control and were 2° F. higher in the uncovered tank. During March and April, air temperatures increased so that the control tank water temperatures did not differ greatly from those in the heated tanks. The production in each of those tanks for the two months was: 6,019 in the control, 1,649 in the covered, and 7,541 in the uncovered. It appears from the results that a relatively slight rise in water temperature may create favorable spawning conditions and that a relatively large increase in temperature is not necessary.

Growth of young tilapia in the three aquaria, one each with fresh, brackish, and sea water, was very poor, averaging less than 1 millimeter per week, even though 1/Research conducted by the Bureau's Honolulu Biological Laboratory is now listed under "Central Pacific Fisheries Investigations" instead of "Pacific Oceanic Fisheries Investigations."

the concentration of young in the aquaria was similar to that which produced good growth in the larger outdoor tanks. On April 9, a new experiment was started in two outdoor tanks, each about 700-gallon capacity. In the first two weeks, the fish grew at a rate of 2 millimeters per week in the tank with 6,000 fish and 3 millimeters per week in the tanks with 3,000 fish. In the latter tank, the total growth was as great in two weeks as during five weeks in the aquaria. These growth experiments are being continued with emphasis on variations in growth as induced by variations in the type and quantity of the food given to the fish.

During calendar year 1958, the Honolulu Laboratory operated a tilapia rearing plant on the island of Maui. This operation, carried out as an experiment to determine the economic feasibility of rearing tilapia for bait to be used in the Hawaiian skipjack livebait fishery, yielded a total of over one million fry. In January 1959, this plant was reactivated by the Bureau's Honolulu Laboratory with the primary objective to determine if early spawning could be induced in order that these supplemental baitfish could be made available to the skipjack fishermen early in the summer season. Heating, filtering, and aeration systems were installed in the tanks, along with an improved drainage. Early spawning was successfully induced. More favorable weather conditions and water temperatures, along with the improvements in the tanks mentioned above, have resulted in a total production of approximately 567,000 fry by the end of the month of May, this to be compared with 73,000 fry during a similar period in 1958. The total production for the month of May approximated 300,000 fry, ten times that for the same month in 1958.

During May, Bureau biologists met with representatives of the Board of Agriculture and Forestry of the Territory of Hawaii and a Hawaiian Tuna canning firm, to discuss the implementation of a Territorial bait-rearing program. The Territorial legislature made an appropriation of \$130,000 for the construction of a bait-rearing facility by the Board of Agriculture and Forestry, together with an additional \$51,000 for its operation through the next biennium.

* * * * *

RELATIONSHIP FOUND BETWEEN SEA SURFACE TEMPERATURE AND ABUNDANCE OF SKIPJACK TUNA: A study of the ocean climate for the waters surrounding the Hawaiian Island is being made by the U. S. Bureau of Commercial Fisheries Honolulu Biological Laboratory. One section of this study is concerned with the month-to-month, the seasonal, and the year-to-year changes in the temperature and salinity of the surface waters in this area. Principal emphasis has been placed on the gaining of an understanding of those processes which are of primary importance in the fluctuations of the oceanographic properties, particularly the surface temperatures.

These studies have revealed that the rate of sea surface temperature change at any location throughout the area is characteristic of that location. Applying this discovery to data from the Koko Head monitoring station, a number of applications have become apparent. One is that these characteristic curves have a predictive value. The time during the early part of the year when the rate of change of temperature is zero is associated with the availability of skipjack tuna to the commercial fishery. When the index (when the monthly rate of change of temperature is zero) occurs during the last week of February or before, better-than-average total landings for the summer fishing season may be expected. When the index occurs later in the spring, such as in March, a poor fishing season may be expected. These apparent relationships imply that the sequence of oceanographic events in the early part of the year "set the stage" for a favorable environment (or not so favorable) for the skipjack later in the spring and summer.

This year, the index occurred during the first half of February and the shape of the characteristic curve exhibited some features similar to the curve of 1954, a

year during which a total of 14 million pounds of skipjack (one of the best years on record) was landed at Honolulu. From this it was predicted that the 1959 skipjack season would result in a better-than-average catch. The May skipjack catch for the Territory, with a reduced fleet, totaled approximately 1.7 million pounds, the second highest postwar May landings. The catch for the same month in 1958 was about a tenth of this figure; the total 1958 catch was 6.8 million pounds. Hindcasting, using the 1958 characteristic curve, suggested that this would be the case.

* * * * *

SKIPJACK TUNA STUDIES OFF HAWAII CONTINUED (M/V Charles H. Gilbert Cruise 44): Learning more about the skipjack tuna in the waters off Hawaii was the objective of a cruise by the fishery research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. The vessel returned June 1 from a 34-day trip, the third in a series.

Studies of the year-round changes of oceanographic conditions and skipjack landings have led the scientists at the Bureau's Laboratory to believe that skipjack tuna prefer a certain type of water. The year-to-year variations in landings at the Honolulu cannery may be related to variations in time of entry and amount of this type of water, an extension of the California Current, into the Hawaiian area. Its presence may be detected by shipboard chemical analysis and temperature measurements.

During May 1959 the California Current Extension water was spread over a considerable area surrounding the Hawaiian Islands. Intermingled was water thought to be from the Kuroshio Current which flows into the island area from the north and west.

Skipjack schools were seen only when within 100 miles of the Islands, and the most promising schools were observed 40-60 miles west and northwest of Kauai during mid-May. A number were caught and released after being marked with a special tag. Information obtained when these tuna are recaptured will add to knowledge of the growth and migration of these commercially-important fish.

Flag-line fishing was carried out and net tows were made to determine the kinds and abundance of marine animals to be found in the various types of ocean water encountered during the cruise.



Crabs

NORTH AND SOUTH CAROLINA BLUE CRAB STUDIES: The U.S. Bureau of Commercial Fisheries wants to know the cause of the annual fluctuations in size of the Atlantic blue crab stocks, the distribution of the stocks, and methods for predicting the annual abundance of crabs.

To find those answers, the Bureau is tagging crabs in South Carolina and North Carolina. Results of tagging 1,642 mature crabs (over 5 inches in width) in January 1958 in the estuary of the North Edisto River, S. C., indicated no substantial movement of tagged crabs away from that area. To substantiate these findings and to determine if crab movement in other estuarine areas is similar, 2,088



tagged crab were released in the North Edisto River, Charleston Harbor, and Bull Bay during the January-March 1959 period. As in 1958, the studies are in cooperation with the Bears Bluff Laboratories, Wadmalaw Island, S. C.

Of the 6,250 commercial size crabs (over 5 inches in width) tagged in the Neuse River and Pamlico Sound, N. C., in 1958, 29.3 percent of the Neuse River tagged crabs and 16.4 percent of the Pamlico Sound tagged crabs have been recaptured.



Croakers

FISHERMEN NOT RESPONSIBLE FOR SHORTAGE IN CHESAPEAKE BAY: Sport and commercial fishermen together catch only one in ten croakers that disappear from the Chesapeake Bay each summer, according to biologists at the Virginia Fisheries Laboratory, Gloucester Point, Va.

"Of all the older croakers entering the capes from the Atlantic each spring, two-thirds apparently die or disappear before they return to the ocean in the fall," points out one of the biologists who has been analyzing the returns of fish tags from croaker fishermen during the last two years. "However, only one tenth of the total deaths can be attributed to fishermen," he declared. Another biologist, in charge of the Laboratory's finfish investigations, adds further that age analysis investigations have indicated that croakers are not particularly long-lived fish. The rate of decline in numbers of older fish in the Bay compares closely with the estimate made from tag returns.

These results counter the traditional idea that the decline of a fishery is invariably due to too many fish being caught. Although this may definitely be so from some fisheries, it has not been demonstrated to be a primary cause for decline of the croaker fishery. Natural causes of decline, though not as obvious to fishermen as the fish they see landed in their boats, often play a major part in bringing about a scarcity. Many natural conditions reduce the numbers of fishes in the Bay. These include long periods of unfavorable weather, disease, and increased numbers of other fish which may compete for food or may prey on croakers.

Studies to date show that commercial and sport fishing in the Bay does account for the death of millions of fish, but has relatively little effect on the total abundance of croakers in Virginia. Hampering fishing efforts with unsound regulations may rob fishermen of their bread and butter and the fishery will not be benefited.

Unfortunately fishery scientists do not yet have the detailed information needed to accurately determine the normal mortality (death) rate of most marine fishes. More research in this vital area is necessary. As the biological and physical mechanisms effecting changes in fish populations are better understood, biologists will more accurately forecast the abundance of fish and will give explanations for "good and poor" fishing seasons.



Federal Purchases of Fishery Products

DEPARTMENT OF DE-FENSE PURCHASES, JAN-UARY-MAY 1959: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.0 million pounds (value \$1.1 million) of fresh and frozen fishery products

	Table 1 - Fresh and Frozen Fishery Products								
	Purchased by Military Subsistence Market								
		Cente	rs, Ma	y 1959	with C	ompar	isons		
		QUAN	TITY			VAI	JUE		
	Ma		Jan		May JanMay				
					1959				
(1,000 Lbs.)						(\$1,	000)		
	1,997	2,054	9,134	9,310	1,035	1,152	4,817	5,294	

were purchased in May 1959 by the Military Subsistence Market Centers. This was less than the quantity purchased in April by 8.7 percent and 2.8 percent under the amount purchased in May 1958. The value of the purchases in May 1959 was higher by 5.4 percent as compared with April, but was 10.2 percent less than for 1958.

For the first five months of 1959 purchases totaled 9.1 million pounds, valued at \$4.8 million—a decrease of 1.9 percent in quantity and 9.0 percent in value as compared with the same period of 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in May 1959 averaged 51.8 cents a pound, about 6.9 cents higher than the 44.9 cents paid in April, but 4.3 cents lower than the 56.1 cents paid during May 1958.

Canned Fishery Products: Tuna and sardines were the principal canned fishery products purchased for the use of the Armed Forces during May 1959.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, May 1959 with Comparisons								
		QUAN	TITY			VAL	UE	
Product	M	ay	Jan	May	Ma	ay	JanMay	
	1959	1958	1959	1958	1959	1958	1959	1958
		(1,000	Lbs.) .			(\$1,	000)	
Tuna	424	315	1,832	1,270	210	158	868	640
Salmon	7 - 7 1,327 5 - 5						724	
Sardine	229	_	509	33_	26	-	72	12

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated, because it is not possible to obtain local purchases.



Fish-Farming

LAND PURCHASED IN ARKANSAS FOR RESEARCH: Purchase of two tracts of land in two important Arkansas rice, soybean, and cotton growing areas for the development of a fish-farming research station was announced on June 1 by the U. S. Department of the Interior. The land acquired for the projects totaled 296 acres.

The purpose of the research is to provide practical ways by which fish-farming can be conducted profitably in conjunction with agricultural crop growing. The University of Arkansas, through its network of agricultural experiment stations, has long been interested in finding income crops for rotation with rice production, and experience in recent years indicates that fish might be such a crop. However, numerous problems on stocking, disease control, predation, competition, and reservoir management must be solved before that type of fish-farming can be economically feasible.

On March 15, 1958, the President signed a bill which authorizes two major fields of activity:

(1) Biological research on all the problems of fish rearing--selection of species, parasites and diseases, reproduction, food requirements, water quality, predation and competition, and selective breeding for special qualities of growth, disease resistance, and tolerance to special conditions.

(2) Technological improvement--harvesting methods and preparation of fish for the market.

The two Bureaus of the U. S. Fish and Wildlife Service--the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries--will work together to carry out all the provisions of the Act. The former, which does research on fish-cultural problems and fresh-water fishery management, and operates some 100 fish hatcheries over the country, will have responsibility for the biological research, and the latter for technological and market promotion aspects.

One of the purchased tracts comprises 85 acres immediately adjacent to the Rice Branch Experiment Station near Stuttgart. The other is 211 acres adjoining the Southeast Branch Experiment Station at Kelso (P. O. Rohwer). Thus there will be excellent opportunity for close cooperation, joint research effort, especially in crop rotations, and day-to-day consultation. These opportunities are enhanced by the fact that crop research specialists of the U. S. Department of Agriculture are stationed at one of the two University experiment stations.

Biologists of the Arkansas Game and Fish Commission, the Agricultural Extension Service, and the Soil Conservation Service of the Department of Agriculture have had a long-time interest in managed farm ponds and reservoirs for multiple use, including fish and waterfowl. They have provided technical and extension services and consultation to farmers and the general public on pond and reservoir construction, stocking, and management with the best information available.

Other activities, like fishery economics and market promotion and development, are long-established functions of the U. S. Fish and Wildlife Service, and limited assistance has been given to fish farmers already. The very great problem of weed control will be given attention principally by the University of Arkansas Agricultural Experiment Station, Department of Agriculture, in cooperation with fishery biologists.

The U. S. Bureau of Sport Fisheries and Wildlife is making plans for construction and staffing the new station. The Stuttgart site will have ahead-quarters and laboratory building, experimental ponds, and a small reservoir. The southeastern land will be developed for larger-scale experimentation to extend and test the laboratory fishdings. Although long-range and fundamental research will be included in the program, it can reasonably be expected that useful results will come from time to time for practical application. These will be made available promptly through publication to all interested, and to the State Game and Fish Commission, the Agricultural Extension Service, other State conservation agencies, and the Soil Conservation Service for use in their technical and extension activities.

The Stuttgart property will have a modern, functional laboratory, fish-holding facilities, a service

building for shop, garage, and storage, a reservoir of about 30 acres, and experimental ponds ranging from one-tenth acre to one acre in surface area. The Kelso land already has a building and a high gallonage rice well, and an adequate surface water supply. Well-stablized levees have been constructed on three sides of 160 acres of the plot. Five-, ten-, and twenty-acre reservoirs are planned for the site. There is excellent prospect for experimental work on two nearby 80-acre reservoirs to be constructed by the landowner.

Construction of facilities and the development of the two tracts of land for research purposes, and initial staffing will proceed as soon as appropriations are made. Engineering specifications have not been drawn up, but a general layout plan has been made with the advice and assistance of Dr. S. W. Ling, fishery expert for the Food and Agricultural Organization of the United Nations. Dr. Ling recently visited the sites in Arkansas as well as several research stations and fish hatcheries in the South.

Professional staffing contemplates a team of research specialists in aquatic biology, microbiology and parasitology, physiology, biochemistry, biostatistics, and genetics. There will also be supporting personnel for fish handling, water management, and maintenance.

Work with several groups of fish can be foreseen now. The catfishes, buffalofishes, and basses will be important, and an additional good possibility is for carefully controlled experiments with a desirable import which has not yet been tried in the United States.



Fisheries Loan Fund

LOANS APPROVED THROUGH MAY 31, 1959: As of May 31, 1959, a total of applications for fisheries loans totaling \$18,610,193 had been received. Of these 313 (\$7,654,233) have been approved, 209 (\$5,740,789) have been declined or found ineligible, 41 (\$1,677,126) have been withdrawn, and 23 (\$2,916,029) are pending. Several of the pending cases have been deferred indefinitely at the request of the applicants. Sufficient funds are available to process new applications when received.

The following loans were approved between April 1 and May 31, 1959:

New England Area: Alexis Fagonde, Jr., Beals, Me., \$3,000; Murray Pinkham, Boothbay Harbor, Me., \$4,000; Frederick P. Elwell, St. George, Me., \$2,000; Elizabeth N. Corporation, Fairhaven, Mass., \$36,830; Tripolina Bramante, Medford, Mass., \$35,000, C & F Fishing Corporation, New Bedford, Mass., \$46,600.

South Atlantic and Gulf Area: Sidney J. Clopton, Pensacola, Fla., \$14,800; W. D. Coons & A. E. Moorer, Mt. Pleasant, S. C., \$17,000.

California: Wm. Howard Day, San Diego, Calif., \$19,950; Wm. G. Huston, San Diego, \$7,000; Salvatore Tarantino, San Francisco, \$2,500.

Pacific Northwest Area: Kenneth E. Staffenson, Agate Beach, Oreg., \$3,500; Clayton C. Howe, Anacortes, Wash., \$2,000; Alex. C. Prankard, Olympia, Wash., \$6,232; Earl E. McCarthy, Seattle, Wash., \$29,600; Ora L. Olson, Snohomish, Wash., \$29,524.

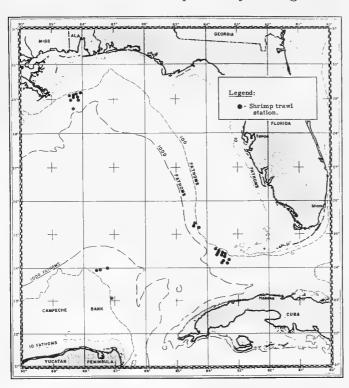
Alaska: Douglas R. Freed, Elfin Cove, \$2,500; Edward K. Haffner, Juneau, \$5,600; Sig Dale, Ketchikan, \$3,305; Victor Edenso, Ketchikan, \$6,000; Arne Iverson, \$10,500.

Hawaii: Sea Queen Fishing Co., Honolulu, \$20,000.



Gulf Exploratory Fishery Program

ROYAL-RED SHRIMP EXPLORATIONS IN GULF OF MEXICO (M/V Silver Bay Cruise 17): Trawling transects through the royal-red shrimp grounds off Mobile, Ala., and Dry Tortugas were made during a nine-day cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. The objective of the



M/V Silver Bay Cruise 17 (June 2 to 12, 1959).

trip was to determine the availability of red shrimp in the two areas previously delineated by the Bureau's vessel Oregon and to check on optimum fishing depths. Forty-foot trawls were used.

The best catches were made southwest of Dry Tortugas where nine drags between 100 and 500 showed red shrimp present in depths ranging from 160 to 300 fathoms. Fishable concentrations were present between 180 and 220 fathoms. Two four-hour drags in 200 fathoms caught 500 pounds of 31/35-count red shrimp.

Eight drags were made off Mobile between 200 and 600 fathoms. Royal-red shrimp were present in all catches between 200 and 400 fathoms but only in small numbers.

Four exploratory drags in the red shrimp depth range along the eastern edge of Campeche Bank resulted in gear damage due to bad bottom.

During the run between Campeche Bank and the North Gulf trawling area numerous mixed schools of skipjack and blackfin tuna were observed, chiefly in the early morning and late afternoon. A large concentration of schools of very small unidentified tuna was observed between 27°30' and 28° north latitude along 88°20' west longitude.



Insecticides and Pesticides

INTERIOR DEPARTMENT ENDORSES EN-LARGED RESEARCH PROGRAM ON EFFECTS ON FISH AND WILDLIFE: Endorsement of legislation to increase the scope and value of the research now being conducted to determine the effect of insecticides and pesticides upon fish and wildlife resources was announced by the U.S. Department of the Interior on June 21.

Investigations which have been made under existing legislation clearly indicate a problem of much greater magnitude than originally contemplated and show that the existing authorization is inadequate, the Department report stated.

In letters to Chairman Warren S. Magnuson of the Senate Committee of Interstate and Foreign Commerce and to Chairman Herbert C. Bomer of the House Committee on Merchant Marine and Fisheries, Assistant Secretary Ross L. Leffler cited some of the known harmful effects of current practices in the use of pesticides on wildlife and on fresh-water and salt-water fish. Four major objectives of the research program listed in the report are:

- (1) To determine the acute and chronic toxicities of some 200 basic pesticidal chemicals on the market, plus the many which are in various stages of development;
- (2) To conduct chemical analyses of plant and animal tissue to determine the presence of pesticide residues, to develop diagnostic procedures for determining suspected poisonings, and to measure the degree and duration of toxic conditions in fish and wildlife habitats:
- (3) To carry out field appraisals of immediate and long-range effects of pest control operations upon fish and wildlife populations;
- (4) To facilitate the compilation and dissemination of findings from research studies so that chemists, entomologists, and others may apply such knowledge in the development of new pest-control materials, formulations, and techniques of application to minimize hazards to desirable forms of animal life.

The Assistant Secretary for Fish and Wildlife pointed out that while in 1940 the wholesale value of the pesticides then being used in this country was \$40 million, this had jumped to \$290 million in 1956. By 1975, it is estimated that the wholesale value of such materials will aproach the billion dollar mark. One-sixth of all the croplands and millions of acres of forests, rangelands, and marshlands are treated annually with these chemicals. Most of these areas are important wildlife and fish habitat.

Some of the chemicals persist in the soil for periods of three to five years or longer. Certain

food chain organisms, such as earthworms, living in treated soil or waters, tend to concentrate the poison in their body tissue. Hence, birds like the woodcock or robin, as well as aquatic creatures-fishes, crabs, shrimp and oysters--are affected when they feed upon contaminated organisms.

Studies made to date have shown that DDT may kill fish and other aquatic life when applied at dosage rates in excess of one-quarter pound per acre; two pounds per acre will kill birds; five pounds will cause heavy mortality among mammals. Other insecticides such as heptachlor, dieldrin, aldrin, and endrin, have acute toxicity ranges of 15 to 200 times that of DDT.

Considerable aerial spraying is carried out over salt-water marshes, particularly in the East, and control chemicals applied to land areas adjacent to inshore water reach important fish-producing water by drainaga. There is thus need to determine the effects of pesticides on inshore aquatic life--fish, shrimp, and shellfish--which live in these waters as adults and on these species for which the marshes and estuaries are essential nursery grounds. Menhaden, shad, striped bass, croakers, and sea trout or weakfish are reared in those areas during their early stages. Shrimp, crabs, oysters, and clams which support major commercial fisheries, spend a part or all of their lives in inshore environments.

Findings from limited studies carried out at the Galveston Laboratory show that lindane, an insecticide employed for the control of mosquitoes, is very toxic to shrimp. A total kill of laboratory test animals resulted within 24 hours after exposure to concentrations of the chemical as low as five parts per billion. Other findings reveal that crabs may be killed by eating fish containing low levels of malathion.

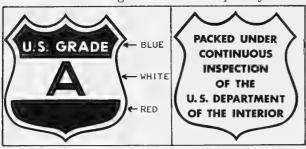
The proposed legislation, H. R. 5813 (S. 1575), would raise the authorization from \$280,000 to \$2,565,000 a year. The Assistant Secretary stated that while the present appropriation authorization was inadequate, no specific authorization should be listed in the Act. He recommended that the research program be permitted to expand on a logical and scientific basis and that funds be requested from Congress as required by circumstances and in accordance with established budgetary procedures.



Inspection of Fishery Products

SEATTLE FISH PLANT STARTS PACKING UNDER USDI INSPECTION: Continuous USDI inspection of fishery products was started by one of the larger fish processors in Seattle the latter part of May. This is the first plant in the Northwest to use the voluntary continuous inspection of fishery products now offered by the Bureau of Commercial Fisheries, U. S. Department of the Interior, Seattle. Products produced under continuous inspection may show on the label the shield bearing the U. S. Grade and the words "Packed Under Continuous Inspection of the Department of the Interior." Halibut and salmon steaks and cod fillets are being packed under inspection at the plant. Packing of frozen swordfish steaks and king crab meat will be included later.

Inspection and grading services are available on a fee basis to processors who meet the existing standards of quality for fishery products. Grade standards are



Shield using red, white, and blue background.

Shield with plain background.

now available for halibut steaks, fish sticks, breaded frozen shrimp, and haddock fillets. Grade standards for salmon steaks, cod fillets, and frozen raw breaded fish portions will be available shortly. Inspection services are also available to assure wholesomeness of the product and conformity to written specifications for fishery products not presently covered by established standards.

the country packing 47 fishery products under the Bureau's continuous inspection program.

Institutional Consumption

STUDY POINTS UP POTENTIAL FOR FISHERY PRODUCTS IN MANUFACTUR-ING PLANTS' EATING FACILITIES: The market potential for fish and shellfish (fresh, frozen, and canned) in the eating facilities of the Nation's manufacturing plants is not being fully exploited, a survey made for the U. S. Department of the Interior indicates. The study shows that 85 percent of the plants with food facilities (having 250 employees or more) serve fish and only 52 percent serve shellfish.

Dun and Bradstreet, Inc., made the survey in conjunction with a larger food survey which that firm was making for the Department of Agriculture. The purpose of the survey was to discover and point up areas toward which distributors could direct attention in their drive to sell more of these highly nutritional fishery products. A survey was financed by funds provided by the Saltonstall-Kennedy Act for the betterment of the domestic fishing industry.

The survey showed that manufacturing plants in the northeast section of the country and on the West Coast are more apt to have fish or shellfish on the menu than are plants in the Midwest and South. In the South the use of shellfish on the menu is on a par with the Midwest section of the country.

The survey also showed that the eating places in large plants (plants with over 1,000 employees) are more consistent users of fish and shellfish than those in the smaller plants.

Half of the large plants which have food facilities are located in the north-central part of the United States. This indicates that the possibilities of increasing the sale of fishery products in the manufacturing plants of that region are relatively promising.

The survey showed that company-operated restaurants and cafeterias are more consistent users of fishery products than are contractor-operated eating facilities.



Lobsters

ACTIVITY AND CATCHABILITY OF LOBSTERS: The activity and catchability of lobsters is being studied by the Canadian Fisheries Research Board's St. Andrews Station. The report appears in the Journal of the Fisheries Research Board (vol. 15, no. 6). Activity was measured by the speed with which a lobster retreats when a bright light is turned on it.

When lobsters are accustomed to water of a certain temperature, their walking rate increases with water temperatures from 36° F. to 50° F. and again from 68° F. to 77° F., but there is little change between 50° F. and 68° F. Lobsters used to colder water became more active when temperature increased, but those used to higher temperatures slowed down when moved to either cooler or warmer water.

Fishing experiments in Passamaquoddy Bay showed how much catches fall off as water temperatures go down in the fall. The change in catches fits in well with the decline in activity as shown in the laboratory experiment. The relationship between activity and catchability helps in the interpretation of catch-per-unit-of-effort data. It also explains the improvement in fishing as waters warm in the spring.



Oysters

EXPERIMENT ON GROWING OYSTERS ON RAFTS: An oyster raft culture experiment is being conducted at Taylor's Pond, Chatham, Mass., by the Bureau of Commercial Fisheries Biological Laboratory of Woods Hole, Mass. The study includes oysters from Virginia, Wareham River and Oyster River, Mass. The seed taken from Virginia last fall and held at Taylor's Pond suffered a severe mortality during the winter. The few survivors are not growing as rapidly as the native oysters. If this method of oyster culture is successful, many small salt-water coves and bays can be used for raising oysters despite bottom types.



Salmon

FYKE NET USED IN ALASKA TO MEASURE RED SALMON ABUNDANCE: Each year since 1955 a fingerling fyke net has been installed on the Kvichak River, Alaska, by the Fisheries Research Institute under a Saltonstall-Kennedy Act-financed contract awarded by the U. S. Bureau of Commercial Fisheries to the Institute. The fyke net is designed to obtain an index of abundance of the annual seaward migration of red salmon--the catch of fingerlings in the net was 203,000 in 1955, 50,000 in 1956, 23,000 in 1957, and 1,913,000 in 1958.

The adult red salmon from the ocean which escaped the fishery and entered the Kvichak totaled 250,000 in 1955, 9,443,000 in 1956, 2,965,000 in 1957, and 535,000 in 1958.

The large migration of fingerlings in 1958 was probably brought about by the good escapement in the 1956 brood year and by favorable environmental conditions.

The migrants in 1958 were two years old while those of other years were chiefly three years old. Because fingerlings from the Kvichak usually spend two winters in the ocean to become fully mature before returning to the Kvichak to spawn, a return in 1960 of a substantial portion of the migrants in 1958 is implied.

* * * * *

NEW TYPE OF SALMON COUNTING STATION AT ROCKY REACH DAM ON COLUMBIA RIVER: A radically new type of fish-counting station will be used at Rocky Reach Dam on the Columbia River, the U. S. Bureau of Commercial Fisheries Biological Laboratory at Seattle announced.

At this station the human observer (or camera) is placed in a subsurface room and looks through a large plexiglass window at the weir opening from the side. The counting gate is on the side rather than in the center of the fishway. Those fish which may be traveling up the other side are diverted over by a standard grill. The counting board will be vertical and will contain controllable lights. The opening will be provided with racks for fish-counting tunnels in anticipation of the day when electric counters will be available.

Scallops

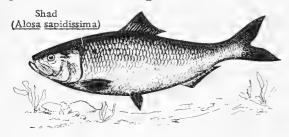
TEMPERATURE OF OCEAN WATERS AFFECTS SURVIVAL OF GIANT SCALLOPS: Scallops in the southern Gulf of St. Lawrence undergo mass mortalities that lead to sudden disappearances of local fisheries. A recent report in the Canadian Journal of the Fisheries Research Board (vol. 15, no. 6) suggests why. A series of critical tests showed that scallops are killed by fairly warm water of 69° F. to 74° F. The exact temperature depends upon the previous temperature experience of the scallop, since those which are accustomed to warm conditions are more resistant to rapid warming. Sudden flooding of scallop beds by warm water may thus lead to mass mortalities. Such floodings have been observed to occur.

Rapid changes in water temperatures can damage scallop populations in a second way. Scallops, unlike other shellfish, are ordinarily mobile and actually escape enemies. Sudden temperature changes such as are known to occur, on the Magdalen Shallows, even if not killing, reduce scallop activity and make them easy prey to their enemies. Populations can be greatly cut down by predation.



Shad

ATLANTIC STUDIES CONTINUED: The Bureau of Commercial Fisheries is trying to rehabilitate the greatly depleted Atlantic shad runs. To achieve this goal, stream conditions must be improved, pollution abated, fishways built, and adequate spawning escapements permitted. The Bureau's present research is designed to provide the knowledge needed to do these things successfully.



Studies on the York River's shad fishery (including Mattaponi and Pamunkey Rivers) were begun February 15, 1959, in cooperation with the Virginia Fisheries Laboratory. The objectives of this study are to determine total catch, fishing effort, fishing rate, size of run, and spawning escapement. As of March 31, a total of 294 shad had been tagged at the river mouth. All

fishermen were asked to keep records of their catch and effort.

Data collected in 1959 will be used with those obtained since 1953 by the Virginia Fisheries Laboratory to determine population parameters for each year that catch and effort data are available. When these data have been obtained for a series of years, studies can proceed to determine factors affecting population abundance.

The commercial shad fishing season on St. Johns River closed March 15, 1959. While complete catch data have not been received, it is evident that the 1959 catch will equal or exceed that of 1958 (552,000 pounds) which was the highest since 1947.

The sport fishery for shad on the St. Johns River is the largest on the Atlantic coast. During the 1959 sport fishing season a voluntary creel census, controlled by two sport camp operators, is being conducted. The return of census cards indicated that the sport catch will be higher than that in 1958 when 65,000 (approximately 175,000 pounds) were taken.

Striped Bass

STUDIES IN ALBEMARLE SOUND, N. C.: The construction of dams and increased pollution in the Roanoke River, the most prominent striped bass production tributary of Albemarle Sound, threaten sustained abundance of the population. To resolve the problems confronting the fishery, a cooperative study for developing this river basin by scientific means became necessary. The United States Fish and Wildlife Service began to participate in this study in 1955 chiefly because the Southeast-

ern Power Administration, administered by the Department of the Interior, controls the sale of power generated by the John H. Kerr Dam and needs information relative to minimum river flows required during the annual striped bass spawning migrations.

In the 1958/59 season the Bureau of Commercial Fisheries' Beaufort, N. C., Biological Laboratory continued for the third successive year to get catch, effort, and age composition data in the commercial striped bass fishery. In the summer of 1956 seine sampling in upper Albemarle Sound revealed a relatively outstanding abundance of young-of-year fish. The 1956 year-class first appeared in the commercial catch during the fall of 1957. The number



Attaching disc tag with nylon thread to striped bass.

of one-year-old fish from this brood year was above normal. The 1956 year-class then constituted the two-year-old portion of the catch in the fall of 1958.

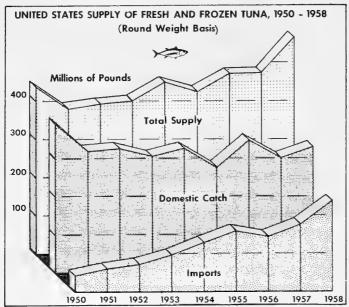
From 1955 through 1958 the fall fishery (September, October, November, and December) in Albemarle Sound yielded 1,117,000 pounds of striped bass. Of this figure, 20 percent was landed in 1955, 20 percent in 1956, 14 percent in 1957, and 46 percent in 1958. The largest portion of the 1958 catch can be assumed to be one-and two-year-old fish since these two age classes constituted from 88 to 95 percent of the total catch each year from 1955 through 1957. Thus, large numbers of young-of-year fish in 1956 and increased numbers of one-year-old fish in the catch in 1957 lead to the conclusion that the pronounced increase in catch in 1958 resulted from an exceptionally large year-class produced in 1956. In 1957 an increase in numbers of one-year-old fish occurred though the total catch was lower then than for any of the fall seasons from 1955 through 1958.

State organizations with limited help from the Fish and Wildlife Service are continuing Roanoke River striped bass population studies to evaluate on a long-term basis the annual abundance of fish in the spawning runs in relation to water discharge from power dams and industrial mill-waste loadings. For the fourth consecutive year a tag-recovery study was begun in March 1959 to estimate population size, spawning escapement and fishing rate.



Tuna Consumption Zooms to Record High in Half a Century

Because the Pacific sardine failed to make its annual appearance in United States fishing waters in 1903, a new fishery was born. When the sardine harvest failed, a few of the hitherto nonutilized tuna were canned and offered to the American public. The canned product was well received and tuna has become the principal fish canned in the United States.



Note: Nearly all of it is canned.

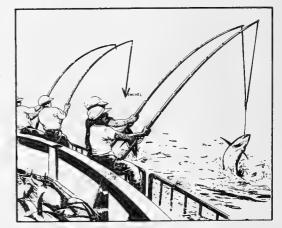
In 1958, 36 canneries in seven States, American Samoa, Hawaii, and Puerto Rico packed 277 million pounds of canned tuna and an additional two million pounds of tunalike bonito and yellowtail. Another 46 million pounds of canned tuna and 12 million pounds of canned yellowtail and bonito were imported in the United States. Tuna is now the leading food fish in quantity landed; and in third place on the basis of value at the ex-vessel level, exceeded only by shrimp and salmon.

Although the industry was started in 1903, records are only available from 1911. In 1911 the Pacific Coast catch was confined to one species, the albacore-850,000 pounds live weight. In 1958, the catch included albacore,

bluefin, yellowfin, and skipjack--326,000 pounds live weight, valued at \$44.6 million.

Until after the close of World War II the United States market was largely supplied by American fishermen, the imports playing a minor part. In the prewar year of 1939, only 4 percent of the pack produced in American canneries was from imported raw tuna. In the postwar year of 1949, it was 3 percent. But in 1958, more than 39 percent of the American pack was from imported raw tuna.

The increase in the ratio of imported tuna already canned to the total supply was not so noticeable. In 1939, the 10 million pounds of canned imported tuna was 12.6 percent of the supply; in 1958, the 46



million pounds imported already canned, was 14.3 percent of the supply.

The peak year for the United States pack of bonito and yellowtail was 1947, when 9 million pounds were canned. In 1958, the pack was two million pounds. The peak of imports on those two varieties was 1957, when 15.5 million pounds of canned yellowtail and bonito were imported. In 1958, the imports of those varieties amounted to 12 million pounds.

United States Fishing Fleet $\frac{1}{2}$ Additions

APRIL 1959: A total of 45 vessels of 5 net tons and over was issued first documents as fishing craft during April 1959--14 less than in April 1958. The Gulf area

Table 1 - U. S. Vesse		nts as	Table 2 - U. S. V						
Fishing Craft by Areas, April 1959							Issued First Documents as		
Λ	Ap:	ril	Jan	Apr.	Total	Fishing Craft by 7	Fonnage,		
Area	1959	1958	1959	1958	1958	April 1959	9		
		(N	Jumbe:	r)		Net Tons	Number		
New England	1	4	6	7	13	5 to 9	26		
Middle Atlantic	- '	-	3	3	13	10 to 19	8		
Chesapeake	9	7	30	31	99	20 to 29	6		
South Atlantic	5	5	23	37	135	30 to 39	2		
Gulf	15	28	40	90	270	40 to 49	1		
Pacific	13	10	21	29	112	50 to 59	1		
Great Lakes	-	-	3	2	10	90 to 99	1		
Alaska	2	5	4	8	31	Total	45		
Virgin Islands	-	-	-	1	1				
Total	45	59	130	208	684	led all other areas			

Note: Vessels assigned to the various sections on the basis of their home ports.

At large with 5 Alarks with 9 and the New York and the South 10 and 10 and

Atlantic with 5, Alaska with 2, and the New England area with 1.

During January-April 1959, a total of 130 vessels was documented as fishing craft--a decline of 78 vessels as compared with the first four months of 1958. Most of the decline occurred in the Gulf area with 50 less vessels documented as compared with the 1958 four-months period.

1/Includes both commercial and sport fishing craft.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, APRIL 1959: Imports of edible fresh, frozen, and processed fish and shell-fish into the United States during April 1959 increased by 7.5 percent in quantity and 6.6 percent in value as compared with March 1959. The increase was due primarily to higher imports of groundfish fillets (up 8.2 million pounds) and frozen albacore and other tuna (up 2.7 million pounds), and to a lesser degree, an increase in the imports of shrimp and canned tuna in brine. The increase was partly offset by a 5.2 million-pound decrease in the

United States Foreign Trade in Edible Fishery Products, April 1959 with Comparisons							
Quantity Value							
			Ap	ril	Year		
1959	1958	1958	1959	1958	1958		
(Mill	ions of	Lbs.)	. (Mi	llions o	of \$).		
i .			,		1 1		
l							
90.4	66.0	956.8	25.9	19.5	278.4		
1							
(excluding fresh and frozen) 5.2 1.3 41.2 1.1 0.3 15.6							
1/Includes pastes, sauces, clam chowder and juice, and other specialties.							
	Ap 1959 (Mill) 90.4	April 1959 1958 (Millions of 90,4 66,0	April Year 1959 1958 1958 (Millions of Lbs.) 90.4 66.0 956.8	April Year April 1959 1958 1959 (Millions of Lbs.) . (Millions of Lbs.)	April Year April 1959 1958 1958 1958 1958 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959 1958 1959		

by a 5.2 million-pound decrease in the imports of canned salmon (down 5.2 million pounds).

Compared with April 1958, the imports in April 1959 were up by 37.1 percent in quantity and 32.8 percent in value due to higher imports of groundfish fillets (up 6.6 million pounds), frozen albacore and other tuna (up 11.6 million pounds), and frozen shrimp (up 3.7 million pounds). Compensating, in part, for the increases was a drop of about 2.5 million pounds in the imports of canned salmon.

United States exports of processed fish and shellfish in April 1959 were lower by 32.1 percent in quantity and 47.6 percent in value as compared with March 1959. Compared with the same month in 1958, the exports this April were higher by 294.6 percent in quantity and 266.7 percent in value. The higher exports in April this year as compared with the same month in 1958 were due to better stocks of California sardines available for export to foreign markets.

* * * * *

GROUNDFISH FILLET IMPORTS, MAY 1959: Imports of groundfish and ocean perch fillets and blocks into the United States during May 1959 amounted to 13.9 million pounds—an increase of 2.9 million pounds, or 26 percent, as compared with the same month last year.

Iceland was the leading country with 5.6 million pounds—a gain of 4.2 million pounds compared with May 1958. Canada was second with 4.9 million pounds—2.7 million pounds less than the corresponding month of last year. Denmark followed with 1.7 million pounds (up 400,000 pounds).

During the first five months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets (including blocks) totaled 74.5 million pounds. Compared with the same period of last year, this was a gain of 17.3 million pounds or 30 percent. Canada (27.7 million pounds) made up 37 percent of the 1959 five-months total. Imports from Iceland (26.4 million pounds) comprised 35 percent of the total, while Denmark (9.1 million pounds), and Norway (8.4 million pounds) accounted for 12 percent and 11 percent of the total, respectively. The remaining 5 percent was made up of imports from West Germany, Miquelon and St. Pierre, the Netherlands, France, the United Kingdom, and Ireland.

The quota of groundfish and ocean perch fillets and blocks permitted to enter the United States at $1\frac{1}{8}$ cents per pounds in the calendar year of 1959 is 36,919,874 pounds, based on a quarterly quota of 9,229,968 pounds. The quota for the calendar year 1958 amounted to 35,892,221 pounds. Imports during individual quarters in excess of the established quarterly quota enter at a duty of $2\frac{1}{2}$ cents a pound. Note: See Chart 7 in this issue.

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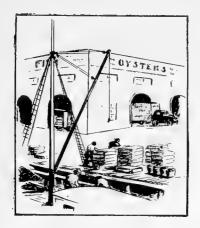
IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA AS OF MAY 30: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the $12\frac{1}{2}$ -percent rate of duty is 52,372,574 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports for January 1-May 30, 1959, amounted to 17,689,773 pounds, according to data compiled by the Bureau of Customs. For January 1-May 31, 1958, a total of 16,035,401 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.



Wholesale Prices, June 1959

Wholesale fishery products prices increased slightly from May to June this year, but were down substantially from June a year ago. The June 1959 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (123.5 percent of the 1947-49 average) was higher by 1.5 percent from the pre-



ceding month, but down by 6.1 percent from same month of 1958. During this June groundfish landings continued to drop off from the early spring run; fresh halibut were in good supply and prices were down from a year ago; and the market for shrimp continued weak due to an oversupply, with prices down sharply from last year.



Table 1 - Wholesale Average Prices and Indexes	Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1959 With Comparisons							
Group, Subgroup, and Item Specification	Point of Pricing	Unit					dexes -49=100)	
			June 1959	May 1959	June 1959	May 1959	Apr. 1959	June 1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					123,5	121.7	122.7	131,5
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish:					139.9 147.9	138.1 145.5	139,6 141,9	150,4 147,2
Haddock, Ige., offshore, drawn, fresh	Boston New York New York	lb. lb. lb.	.11 .34 .78	.10 .35 .78	109.1 105.2 175.8	97.0 107.0 174.1	76.0 102.1 171.3	121,6 123,8 168,5
Whitefish, L. Superior, drawn, fresh Whitefish, L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh	Chicago New York New York	lb. lb. lb.	.57 .88 .68	.78 .95 .60	140.1 177.0 158.3	192.1 192.1 140.7	241.7 217.4 166.5	132.6 141.6 129.0
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb, tins . Shrimp, Ige. (26-30 count), headless, fresh . Oysters, shucked, standards	Boston New York Norfolk	lb. lb. gal.	.38 .85 5.75	.35 .86 5.63	136.7 129.3 133.5 142.3	136,4 117,4 136,7 139,2	136,5 97.0 137.4 142.3	151,3 124.2 163.5 139.2
					122.4	119.8	128.3	139.7
Fillets: Flounder, skinless, 1-lb. pkg Haddock, sml., skins on, 1-lb. pkg Ocean perch, skins on, 1-lb. pkg Shrimp, lge. (26-30 count), 5-lb. pkg	Boston Boston Boston Chicago	lb. lb. lb. lb.	.39 .34 .28 .79	.39 .33 .28 .76	102.1 105.2 112.8 121.1	100.8 103.6 112.8 117.6	103.4 111.4 118.8 128.1	103.4 102.0 116.8 152.0
Canned Fishery Products;					100,4	98.6	99.0	104.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs Tuna, It. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs	Seattle Los Angeles	cs.	23.50 10.80		122.6 77.9	77.9	79.3	120.0 84.0
48 cans/cs	Los Angeles New York	cs.	7.15 8.22	7.15 8.35	83.9 87.5	83.9	82.2 87.5	132,4 82,5

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

The June 1959 wholesale price index for the drawn, dressed, and whole finfish subgroup was up by 1.6 percent from the previous month due to substantially higher prices for large drawn haddock at Boston and for fresh-water yellow pike at New York City, and slightly higher prices for fresh king salmon at New York City. Decreases in wholesale prices for drawn whitefish (down 27.1 percent) at Chicago and round whitefish at New York City (down 7.9 percent) failed to offset the higher haddock, salmon, and yellow pike prices. The subgroup index for this June as compared with June last year was about unchanged (down only 0.5 percent) because this June's lower drawn haddock prices (down 10.3 percent) and substantially lower fresh halibut prices (down 15.0 percent) more than offset higher fresh salmon, whitefish, and yellow pike prices.

The fresh processed fish and shellfish subgroup index from May to June this year was about unchanged. Higher haddock fillet and shucked oyster prices just about compensated for a drop of 2.3 percent in fresh shrimp prices at New York City. The subgroup index in June 1959 as compared with June a year ago was lower by 9.6 percent because of sharply lower prices this June for fresh shrimp (down 18.3 percent). On the other hand, this June's prices for fresh haddock fillets were higher by 4.1 percent and for shucked oysters were up 2.2 percent.

From May to June this year, increases of 1/2 to 1-cent a pound in the wholesale prices for frozen flounder and haddock fillets at Boston and 3 cents a pound for frozen shrimp at Chicago resulted in a 2.2-percent rise in the June index for the frozen processed fish and shellfish. From June 1958 to June this year the subgroup index dropped 12.4 percent, due primarily to a drop of 20.3 percent in the frozen shrimp prices

and slight declines in frozen ocean perch and frozen flounder fillet prices. The only increase in June this year over the same month in 1958 was a 3.1-percent rise in haddock fillet prices.

In June this year the over-all index of canned fish prices rose 1.8 percent over the preceding month, but was down by 4.1 percent from the same month of 1958. The light stocks of canned salmon from the 1958 pack resulted in an increase in price of about 4.4 percent (\$1 a case) from May to June this year. During the same period wholesale prices for canned tuna and canned California sardines were unchanged (substantial discounts offered below quoted prices), but the price of canned Maine sardines dropped 1.5 percent. The drop in prices for Maine sardines was probably due to the lack of offerings of packs containing the smaller fish. Packing of Maine sardines for the new season did not start until June 1 and the pack was limited most of the month because of the lack of packing-size sardines. The sharply lower primary price for California sardines that has prevailed since the end of the 1958 packing season in December continued into the month of June. Prices for this product in June this year were down 36.6 percent from June a year ago because the 1958 pack was greater. However, Maine sardine prices were higher by 6.1 percent and canned salmon was up by 2.2 percent from June a year ago. As of the end of June there were excellent stocks of canned lightmeat tuna available; the market for California sardines was steady, but substantial stocks remained unsold from the 1958 pack; a subnormal pack of salmon was predicted with a prospect of high prices and inadequate supplies in 1959 and the first half of 1960; and the pack of Maine sardines was predicted to be light unless the small herring appear in large quantities as the season progresses.



FILLETS KEEP BETTER AT LOW TEMPERATURES

It is important during transportation and storage that fish be held as close to ice temperature as possible, or even a degree or so below. A few degrees in temperature make a difference in the spoilage time. For example, five boxes of fillets, which represented a selection of fish of good quality from a Canadian plant, were each stored at temperatures ranging between 31.5 and 77° F. The approximate keeping times were as follows: 31.5° F.--11 to 12 days, 33° F.--6 to 8 days, 37° F.--5 to 6 days, 45° F.--2 to 3 days, 77° F.--22 to 30 hours.

The reduction in the storage temperature from 37° F. to 31.5° F. $(5\frac{1}{2})^{\circ}$ doubled the keeping time. Even the reduction from 33° to 31.5° F. made a very significant difference.

This does not mean, however, that a reduction in storage temperature of 37° to 31.5° F. will add 5 or 6 days to the keeping time of all fillets, regardless of quality or extent of contamination. (Spoilage Problems in Fresh Fish Production, Bulletin No. 100, Fisheries Research Board of Canada, Ottawa, 1954.)



International

FISH OILS

WORLD FISH OIL EXPORTS UP IN 1958:

World exports of fish oils (including fish-liver oils) in 1958 totaled 200,000 short tons, up 5 percent from 1957 and the same as 1956. A sharp decline in exports from the United States was more than offset by larger Europeanshipments and near-record exports by the Union of South Africa.

United States fish-oil exports last year were down onefifth from 1957 and were one-third below the record volume of 1955. United States shipments to West Germany and the Netherlands--the major markets for United States fish oils--dropped sharply, probably because of more competitive prices for vegetable oils and whale oils used in making margarine.

Fish Oils (Including Liver Oils): Exports from Specified Countries and Estimated World Total, Averages 1935-39 and 1950-54, Annual 1956-58							
Continent and Country	1958 1/ 1957 1956 Average 1950-54 1935-39						
		.(1,00	0 short	tons)			
North America: Canada United States	5.8 47.0	3.0 58.5	9.3 71.3	11.6 42.2	12.0 1.2		
Total	52.8	61.5	80.6	53.8	13.2		
Europe: Denmark	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
Total	104.7	90.4	96.0	84.2	75.6		
Other: Angola Japan Union of So. Africa	Angola 9.4 13.4 5.7 6.7 .7						
Total	33.6	28.3	16.1	22,4	37.9		
World total 6/. 200.0 190.0 200.0 177.0 135.0							
1/Preliminary 2/Prewar Germany. 3/May include some whale of	1/Preliminary 4/Not available.						

Shipments of fish oils from the several European exporters were up 15 percent in 1958. Norway--the largest exporter in Europe--maintained shipments at a fairly high level despite a sharp decline in output; but stocks were substantially reduced. Almost all the fish oil exported by European countries goes to other Western European countries, Eastern Europe, and the Soviet Union. Iceland's exports were up sharply.

Exports of fish oils from the Union of South Africa in the first 11 months of 1958 totaled 17,890 tons, and were the

largest since 1953. (Foreign Crops and Markets, June 15, 1959, U. S. Department of Agriculture.)

FISHERIES AGREEMENTS

FINNISH-SOVIET FISHING AGREEMENT RATIFIED:

On April 4, 1959, Finland and the Soviet Union exchanged ratifications in Helsinki of the Finnish-Soviet Fishing and Seal Hunting Agreement, which was signed in Moscow on February 21, 1959, and ratified by Finland on March 6, 1959. The Finnish press of March 22 quoted a March 21 Radio Moscow announcement that the Presidium of the Supreme Soviet "has ratified the agreement by which Finland is allowed fishing and seal hunting rights in certain Soviet territorial waters." The broadcast quoted a TASS news item to the effect that the Soviet Government at the request of Finland had agreed "that Finnish citizens in certain coastal communes will have the right to carry on fishing and seal hunting in certain Soviet territorial waters in the Gulf of Finland." The agreement carries essentially the same words.

The territorial waters question was not involved in the agreement. The fishing area involved is entirely within three miles of the Soviet coast. The Finnish-Soviet seaboundary in that area had been marked much earlier by the Finnish-Soviet Peace Treaty, and the Soviets presumably consider that they are ceding rights within their waters. The fishermen involved in the agreement would amount to only 40 or 50 who regularly fish those waters. Due to cumbersome Soviet security controls, it is expected that still fewer are expected to use the privilege.

International (Contd.):

FOOD AND AGRICULTURE ORGANIZATION

CHAIRMAN NAMED FOR WORLD SCIENTIFIC MEETING ON SARDINES:

Donald L. McKernan, Director of the Bureau of Commercial Fisheries, United States Fish and Wildlife Service, has been named chairman of the World Scientific Meeting on the Biology of Sardines and Related Species to be Held in Rome, Italy, September 14-21.

The meeting is being held under the sponsorship of the Food and Agriculture Organization of the United Nations. Mc-Kernan was the choice of the consultive committee which is helping the Biology Branch, Fisheries Division, of the United Nations set up the conference. Mario Ruivo of Portugal is vice chairman.

Throughout the world the populations of sardines (Sardina, Sardinops, and Sardinella) are subject to massive fluctuations which have mystified scientists and made consistent harvest and market planning impossible. The purpose of the world meeting is to consider methods of determining the reasons for these violent population fluctuations and to eventually create a system of predicting supply in time to give the industry a chance to adjust itself to large or small harvests.

Some of the things which the meeting hopes to document include: the extent to which the sardine resources are being harvested; the extent to which exploitation is hampered by fluctuations, through lack of knowledge of the resources and through the lack of biological information about the species. Other things which will be considered will be the value and means of documenting the information about these species already at hand, methods for exchanging information and teaching services, and the type of meetings to be held in the future to further the program.

GENERAL AGREEMENT ON TARIFFS AND TRADE

14th SESSION OF CONTRACTING PARTIES ENDS: The Fourteenth Session of the Contracting Parties to the General Agreement on Tariffs and Trade (GATT), which closed May 30, 1959, made impor-

tant advances towards reducing barriers to world trade.

The Contracting Parties decided to convene a tariff conference commencing in September 1960. The scope of this conference will cover four cate-

gories of negotiations: (1) negotiations among Contracting Parties for new concessions, as proposed by the representative of the United States at the Thirteenth Session; (2) renegotiations with member States of the European Economic Community, pursuant to Article XXIV:6; (3) any renegotiations of concessions in the existing schedules which governments intend to undertake before the end of the current three year period of firm validity; (4) negotiations with countries wishing to accede to the GATT.

Other major work of the Session dealt with the removal of governmental restrictions other than tariffs. Such restrictions, largely quantitative controls over imports, have been a major obstacle to world trade in the postwar period.

A highlight of the Session was the decision reached on the important question of German import restrictions. Two years ago it was determined that Germany was no longer in balance-of-payments difficulties and, consequently, was no longer entitled under the General Agreement to restrict its imports on that ground. Since that time the GATT has provided a mechanism through which a solution acceptable both to Germany and her trading partners has been sought.

Under the terms of the decision, Germany has agreed to remove all nontariff restrictions on a wide variety of goods. Some of these goods will be freed from controls as of July 1 of this year; other moves will be taken in stages during the three-year period of the decision. For the goods still subject to licensing, mainly those covered by the Agricultural Marketing Laws, Germany will endeavor to increase the opportunities for the sale of imports, without regard to country of origin.

The Fourteenth Session was the first meeting of the Contracting Parties since the convertibility measures taken by certain countries at the end of last year. The United States Delegation took this occasion to express its views on the significance of convertibility in the field of trade policy. In a comprehensive statement, the United States Delegation pointed out that the broad establishment of external convertibility generally removed the substantive distinction that had existed for two decades between the currencies of dollar countries and the currencies of others.

The United States statement discussed the interests of the United States in the removal of discriminatory restrictions against its exports; it discussed also the interests of other countries in the removal of discrimination and in the general relaxation of governmental controls. There was a general favorable response to the United States statement. It was discussed in the Plenary Session, as well as in the various working parties. Shortly before the end of the Session, the United Kingdom which had consulted on its balance-of-payments restrictions, announced another major move in removing discriminatory restrictions against dollar goods. The wide range of consumer goods and foodstuffs covered by these liberalization measures will bring the treatment accorded United States imports substantially closer to the degree of freedom enjoyed by European exports in the British market.

Another major accomplishment of the Fourteenth Session was the association of two additional countries with the Contracting Parties. Israel's pro-

International (Contd.):

visional accession was approved with full accession to take place upon the successful completion of tariff negotiations between Israel and the Contracting Parties in the course of the general round of tariff negotiations set for 1960. Limited participation by Yugoslavia in the GATT was also approved by the Contracting Parties. In addition, Poland's application for association with the Contracting Parties was received and will be given careful study by a working party.

In addition to these major problems, a large number of other important subjects were treated at the Session. The Contracting Parties adopted a recommendation recognizing the desirability of avoiding restrictions on the purchase of transport insurance. Recommendations on anti-dumping matters, subsidies, and state-trading were considered and accepted. Requests of countries to alter their tariffs were heard, and after careful consideration were approved with provisions limiting the adverse effects on other countries.

The Contracting Parties also heard reports on the consultations held with the European Economic Community (EEC) or "Common Market" regarding trade problems which might arise from the operation of the Rome Treaty. While restating support for the successful development of the Community, the United States representative strongly protested the proposed common external duty of 30 percent ad valorem on tobacco as too high.

The Contracting Parties have decided that the tariff conference to convene commencing September 1960 shall be held in two phases. The first phase, up to the end of 1960, will be concerned with renegotiations with the European Economic Community, and with any re-negotiations of existing concessions. The second phase, opening at the beginning of January 1961, will be concerned with negotiations for new concessions and negotiations with countries wishing to accede to GATT.

In determining the time table outlined above, Committee I took into account the fact that the powers of the President of the United States enabling that country to participate in tariff negotiations (under the Trade Agreements Extension Act of 1958) will expire on June 30, 1962. The Committee also noted that, in accordance with the provisions of the Rome Treaty, the members of the Euopean Economic Community will start adapting their tariffs to the new common tariff on January 1, 1962, which makes it desirable that the renegotiations contemplated in Article XXIV;6 and, for that matter, the negotiations conducted by the European Economic Community for new concessions, be concluded before that date. (U. S. Department of State news releases of June 1 and May 25.)

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

FRASER RIVER SOCKEYE SALMON RUN FOR 1961 LOOKS PROMISING:

A record-breaking sockeye salmon run appears headed for the Fraser River in 1961. Staff field reports of the International Pacific Salmon Fisheries Commission in 1959 indicate that the current seaward migration of yearling sockeye from the large Stuart and Quesnel Lake systems of the Upper Fraser is very heavy, exceeding the highest expectations.

The Washington Director of Fisheries, a member of the Commission, said June 4, 1959, that similar reports preceded the famous 1958 Adams River run of 19 million fish. He added that with favorable sea survival conditions for the young fish now moving downstream it is not impossible that the 1961 run of sockeye to the Fraser River will approach 10 million fish or double the size of the brood-year run in 1957.

The Commission, which is charged with the management of the Fraser River sockeye and pink fishery in both Washington and British Columbia waters, has directed much of its attention to the reestablishment of the once-great sockeye runs to the Quesnel and Stuart systems which were almost destroyed by the Hell's Gate slide in 1913. In that year 30 million sockeye were harvested principally by Washington fishermen. Within a few years after the slide, the Fraser River salmon runs were almost exterminated and it was not until 1945 that international action resulted in the construction of the Hell's Gate Fishways.

In 1941, the cycle year preceding the construction of the fishways, only 1,100 sockeye salmon spawners were counted on the Quesnel River and 5,000 in the Stuart system. Four cycle years later in 1957 the runs had been restored to a phenomenal level with 230,000 spawners counted in the Quesnel and 750,000 in the Stuart.

INTERNATIONAL WHALING COMMISSION

PROTOCOL FOR AMENDMENT OF CONVENTION ENTERS INTO FORCE:

Protocol to the International Convention for the Regulation of Whaling (1946) contains a provision for "Methods of Inspection." The Protocol was signed by the representatives of the Contracting Governments at Washington on November 19, 1956. Since the required number of ratifications have been deposited, the Protocol to the Convention entered into force on May 4, 1959. It was pro-

International (Contd.):

claimed by the President of the United States on May 14, 1959.

Note: Also see Commercial Fisheries Review, October 1958, p. 47.

NORTH PACIFIC FUR SEAL COMMISSION

PELAGIC RESEARCH FOR 1959 COMPLETED BY THE UNITED STATES:

On April 29, the U. S. Bureau of Commercial Fisheries ended its pelagic fur seal research for 1959. On that date, the last of the three vessels chartered to take fur seals at sea was returned to its owners. During the 301 ship-days spent since mid-January 1959 collecting seals off California, Oregon and Washington, a total of 1,546 fur seals were captured. Studies are under way of the stomach contents, age, sexual development, and other characteristics of the animals.

Under the Interim Convention on Conservation of North Pacific Fur Seals, the United States is obligated to take from 1,250 to 1,750 seals at sea annually for research purposes. The other parties to the Convention--Canada, Japan, and the USSR are also obligated to carry on pelagic research.

UNITED NATIONS

AFGHANISTAN SIGNS CONVENTION ON THE HIGH SEAS:

Afghanistan on April 28, 1959, ratified the Convention on the High Seas, done at Geneva April 29, 1958. This Convention regulates the general regime of the high seas, including jurisdiction over vessels, pollution of waters by radioactive waste, and other matters. Although more than 49 nations have signed the Convention on the High Seas, the required number of 22 ratifications have not been received, therefore the convention is not in force.

Note: Also see Commercial Fisheries Review January 1959, pp. 54-55



Australia

ADDITIONAL FUNDS GRANTED TO PROMOTE THE SALE OF PEARL SHELL:

The Australian Government has decided to grant an additional LA18,000

(about US\$41,000) to promote Australian pearl-shell sales in the United States, Europe and the United Kingdom. In announcing this, the Minister for Trade said that Australian pearl shell exports to the United States were earning US\$1 million a year.

During October 1958, the Australian Government, the Australian pearling industry, and United States importers of pearl shell each contributed LA18,000 to launch the publicity campaign.

* * * * *

JAPANESE PEARL SHELL FLEET OPERATIONS FOR 1959 SEASON:

An 11-vessel Japanese pearl-shell fleet was expected to reach northern Australian waters about June 13 to begin the four-months 1959 pearling season, states a United States Embassy dispatch from Canberra, dated May 27, 1959. The Japanese catch is limited to 375 metric tons during 1959 (474 tons taken in 1958), and the fleet will not be allowed to operate off the coast of Western Australia.

In announcing the details, the Australian Minister for Primary Industry said that owing to the improved quality of plastic buttons, the pearl-shell industry was experiencing marketing difficulties, except for quality shell, and production levels had to be revised accordingly.

* * * * *

SHRIMP LANDINGS, 1953-1958:

Australian landings of shrimp showed substantial increases in fiscal years 1954/55 and 1955/56, but since then they have been dropping steadily (see table.)

Australian Estimated Shrimp Landings (heads-on), by States, 1953/54-1957/58							
	1957/58		1955/56		1953/54		
		(1	1,000 Lbs	.)			
New South	1		ľ				
Wales	1,520	2,386	3,672	4,603	3,558		
Victoria	20	-	1	19	- 1		
Queensland	3,000	2,500	2,400	2,000	700		
West Australia							
Total 4,687 5,075 6,148 6,648 4,303							
Note: Fiscal year	rJuly :	l-June 30					

The 1957/58 landings of 4.7 million pounds were down 0.4 million pounds, or 8 percent, as compared with the 1956/57 landings, and were 1.4 million pounds, or 23 percent below the record 6.1 million pounds reported in fiscal year 1955/56.

Brazil

RECIFE TUNA SALES RESUMED:

At the beginning of May the Brazilian Federal Price and Supply Commission raised the retail price of frozen tuna from Cr\$30 to Cr\$45 a kilo (9.8-14.6 U. S. cents a pound). The Japanese-Brazilian marketing company in Recife had asked for a price of only Cr\$40 a kilo (13.0 U. S. cents a pound). Following the increase in prices, frozen tuna became fairly plentiful in the retail markets. It is believed that the Commission raised the retail price to Cr\$45 in order to provide a greater retail mark-up margin. However, when the higher price was announced, the Japanese-Brazilian marketing company immediately raised the wholesale price from Cr\$23 to Cr\$38 a kilo (7.5-12.4 U.S. cents a pound). The retail and wholesale prices for frozen tuna at Recife are subject to further negotiations between the marketing company and the Commission. (United States consulate dispatch from Recife, May 11.) Note: Values converted at rate of US\$1 equals Cr\$139.50.

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SHRIMP PRODUCTION AND FOREIGN TRADE, 1954-1958:

Production: Landings of shrimp in Brazil were about 45.6 million pounds in 1957 as compared with about 38.1 million pounds in 1956, and 42.9 million pounds in 1955, according to official sources. Estimates of the landings of shrimp from other sources are much lower (about 45-50 percent) than official estimates.

Imports: Shrimp imports by Brazil are negligible and amounted to only 440 pounds of cured shrimp from Japan in 1955, 602 pounds of canned shrimp from the United States in 1954, and 92 pounds of canned shrimp from Norway in 1956. Other imports of shrimp between 1954 and 1958 were either nonexistent or in quantities too small to report.

Exports: The only exports of frozen shrimp appearing in the official statistics of Brazil between 1954 and 1958 were made to the United States late in 1958 and amounted to 14,400 pounds (value US\$3,440 c.i.f.). In 1955, 743 pounds of canned shrimp were exported to Uruguay; in 1957,

37,000 pounds (value US\$18,715 c.i.f.) were exported to some unspecified countries. In 1958, Canada received 90,000 pounds (value US\$41,803 c.i.f.) and the Union of South Africa received 2,300 pounds (value US\$1,404 c.i.f.) of canned shrimp.

The statistics on Brazil's foreign trade in shrimp indicate that beginning in 1958 shipments of both canned and frozen shrimp began to pick up and due to fairly plentiful supplies may increase in the future. The 14,400 pounds of frozen shrimp exported from Brazil in 1958 appeared in U. S. Bureau of the Census import data for February 1959.



British Guiana

INITIAL SUCCESS OF SHRIMP FISHING VENTURE:

The private shrimp fishing venture inaugurated in April in British Guiana by a group of United States fishing companies has met with initial success. Shrimp apparently are being caught in very good quantities, with the best locations reported to be off the coast of French Guiana. An initial shipment of 91,000 pounds was made to New York during the week of May 25 and more are expected to follow shortly.

A fifth United States firm now has become associated in the venture, according to a United States Consulate dispatch from Georgetown of May 29.



Cuba

CUBAN MARITIME AGENCY ABSORBS FISHERIES ORGANIZATION:

The Board of Directors and the Executive Committee of the National Fisheries Institute (Instituto Nacional de la Pesca) were dissolved and their powers and duties entrusted to the delegate of the Cuban Maritime Agency which recently absorbed the formerly autonomous fisheries organization. (United States Embassydispatch from Havana, dated May 21, 1959.)

Ecuador

FAO TECHNICIAN REPORTS ON SHRIMP FISHING INDUSTRY:

Ecuador's shrimp stocks are stable, reports a Food and Agriculture Organization technician, but the catch per boat is lower due to the large number of vessels fishing for the available supply.

His preliminary investigations of the Ecuadoran shrimp industry have led him to the conclusion that no special conservation measures may be required to guarantee stable shrimp resources along Ecuador's coast, especially in the area of the Gulf of Guayaquil. His opinion is based largely on the circumstances that the weather along the Ecuadoran coastline reflects a practically constant year-around environment. According to the technician, the stable environment suggests that there may be no special spawning season for shrimp, and that shrimp fishing can be scheduled during the entire year. When asked if he thought that indiscriminate fishing of all types and sizes of shrimp might result in depletion of shrimp resources, he pointed out that since one female shrimp lays as many as one million eggs, there was little reason to believe that continuous fishing could destroy shrimp resources. He stated that his tentative conclusion is that it would not be necessary to advise the Ecuadoran Government to establish closed seasons.

His investigations led him to believe that Ecuador could continue in the future to produce about 3-1/2 to 4 million pounds of shrimp for export yearly, provided no unusual changes in ocean currents occurred or no large-scale shrimp migrations took place. In his opinion, the present recession in the local frozen shrimp export trade has been due more to the expanded size of the fishing fleet rather than to disappearance of shrimp from the coast. He feels that the problem simply involves too great a number of boats in operation. He pointed out that the total volume of catches was roughly the same, but that the expanded number of boats in operation had resulted in a sharp decline in the catch per boat. In commenting upon ways in which the total volume of shrimp catches could be increased, he noted that only one shrimp trawler was reported to be equipped for fishing at depths of 40 fathoms or more. He believed that if larger trawlers were available equipped to fish at greater depths, the volume of catches could be easily increased.

The FAO technician also stated that he had heard proposals were under consideration among several fishing companies to form a new shrimp fishing association for the purpose of better organization among fishing companies, the promotion of more modern fishing methods, and for the solution of problems affecting the industry as a whole. Attempts to form such an association had been made before, but those efforts failed due to arguments between the companies. One of the main stumbling blocks to such attempts was the question of regulation of fishing so as to exclude the catching of small size shrimp. While many companies reportedly were in favor of such regulations, several refused to accept such a prohibition and continued to fish all sizes of shrimp.

He also observed the considerable difficulty which continues to exist locally in the matter of obtaining reliable statistics on the number of active fishing vessels and the landings of shrimp and fish. The only currently feasible means of obtaining reasonably-accurate statistics is to seek information from all possible sources and to draw an average.

Aside from the decline in the frozen shrimp export trade which started in 1958, the industry has been facing two additional problems. One of these concerns the occasional attempts of foreign-registered trawlers to engage illegally in shrimp fishing in Ecuadoran waters. An example of this occurred early in 1959 when some Peruvian-flag trawlers were caught by Ecuadoran patrol vessels fishing illegally in Ecuadoran waters in the Gulf of Guayaquil. The other problem faced by the industry concerns illegal business operations among the companies themselves. For example, several companies recently joined together to submit a protest against an alleged practice which they reported had been set up and which comprised the establishment of small companies at the port of Puerto Bolivar, southeast of Guayaquil, which openly purchased up to 50 percent of shrimp catches from the captains of fishing vessels at prices higher than those in the contracts between the captains and the large

companies in Guayaquil. (United States Consulate dispatch from Guayaquil, dated May 18, 1959.)

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SHRIMP FISHERY TRENDS:

Ecuador's exports of shrimp (mostly frozen) January-March 1959 amounted to 1,381,000 pounds with an f.o.b. value of US\$239,962, according to the Central Bank's mimeographed Report on Exports and Production of Major Crops. Shrimp exports during the year 1958 amounted to 3,310,000 pounds with an f.o.b. value of \$812,084, while in 1957 they totaled 4,490,000 pounds.

Since trade sources estimate that less than 10 percent of all shrimp caught along the Ecuadoran coast are sold for domestic production, there seems to have been a drop in the catch of shrimp from 1957 to 1958. (United States Embassy dispatch from Quito, May 28, 1959.)



Fiji Islands

NEGOTIATIONS REPORTED FOR JAPANESE VESSELS TO FISH FOR BRITISH FIJI ISLANDS CANNERY:

Lately, attention has been attracted by a report that a canning company in the Fiji Islands (a British territory near Samoa) is hoping to invite Japanese fishermen and technicians to its newly-built cannery. The Japanese Fisheries Agency refuses to comment on the report, which it says is unconfirmed, but it is arousing great expectations in Japanese tuna fishing circles, where at present there is an excess of fishing potential.

According to the reports, conversations have been carried on between officials of Wakayama, Mie, and Aichi prefectures and the president of the Fiji Islands canning company, who came to Japan for the first time in May. It is said that the parties are close to signing a contract. The scope of the scheme is reported as follows:

Prefectural authorities will select boats and fishermen in consultation with local fishery cooperative associations and the boats will sail from Japan in about three months. Vessels of about 150 tons will be used. Contracts will be for one year, but may be renewed if desired. Living quarters have already been built. Tuna

Fiji Islands (Contd.):

can be taken almost all year-round in Fijian waters.

A total of 12 technicians has been requested, including supervisory engineers, refrigeration experts, electricians, and office workers. They will have four-year contracts, and can bring their families from Japan to live with them. Supervising engineers will receive salaries of about \(\frac{\psi}{2}\)200,000 (US\\$555) a month, plus a bonus on sales over the planned goal. The equipment and supplies for the new cannery have already been purchased. (Nippon Suisan Shimbun, June 3, 1959.)



Greece

FISHING INDUSTRY EXPANDING STEADILY:

The fishing industry of Greece has been expanding steadily since World War II. Through the application of a development program, sponsored and financed by the United States Aid Mission, the industry underwent modernization and expansion during this period.

Before the war about 3,000 small vessels, few of which were motor-driven, engaged in fishing. Since the war, the Greek fishing fleet has increased rapidly both in the number of vessels and average tonnage. At the beginning of 1958 the Greek fishing fleet consisted of 12,716 vessels of which 3,515 were motor-propelled. The Greek deep-sea fishing fleet, which accounts for about 75 percent of the total fish catch, was composed of 795 motor trawlers and purseseine boats in 1958, as compared to 500 in 1938 and 683 in 1954. Average tonnage of the deep-sea vessels, most of which are of postwar construction, is 41.4 tons per vessel in 1957 as compared with 13.9 tons in 1938. All the deep-sea fishing vessels are equipped with imported or locally-made Diesel or semi-Diesel engines. Many craft have cold-storage facilities and about 80 motor trawlers are equipped with radiotelephone and sonar apparatus. Since 1953 four large fishing vessels of about 500 gross tons each have been added to the country's fishing fleet.

Landings by the fishing fleet increased from 25,000-35,000 metric tons in the prewar period to 46,000 tons in 1953, 60,000 tons in 1955, and 75,000 tons in 1957.

Fish processing also has made marked progress. Greece has some 120 packing plants with annual output of about 6,000-6,500 tons, as compared with a prewar average of 1,500 tons. The fish processed are bonito ("Greek salmon"), sardines, anchovy, mackerel, and tuna. Greece also has these fish canning plants processing primarily bonito, which account for 90 percent of total canned fish production. The Greek fish-canning industry is still relatively undeveloped with production in 1957 only 850 tons. Plans are under way for the construction of modern fish markets in a number of distribution centers, including Piraeus and Patras. These will be equipped with modern handling and storage facilities.

Progress is being made in restocking and developing fresh-water fisheries, particularly in Northern Greece.

Sponge fishing is carried out in Greek waters and off the coast of North Africa. Before World War II the inhabitants of the islands of Hydra, Aegina, and Limnos and those of Trikery (Volos) engaged in sponge fishing and made an annual catch of some 40-50 tons. Since the war Greek sponge production has increased mainly because of the annexation of the Dodecanese Islands, where sponge fishing is an age-long tradition. A total of 149 sponge-fishing craft were in operation in 1956, and 169 in 1957. Production was 115 metric tons in 1956 and 114 metric tons in 1957. The Greek sponge fishing industry is encountering difficulties on the world market because of the competition from synthetic sponges and the requirement of some North African countries that high royalties or fees be paid before Greek fishermen are permitted to operate in their territorial waters.

Despite the very substantial progress made in agricultural and fishery production in the postwar period, Greece still depends on imports for a substantial portion of its food requirements.



Iceland

FISHERIES TRENDS, JANUARY-MAY 1959:

The unusually bad weather in Iceland curtailed fishing during most of February and March. However, catches were so good the following month that by the end of the inshore season in mid-May landings may have equaled the excellent record of 1958. Although the landings picked up, there is some question as to whether or not the value of the winter season landings will equal the 1958 record.

Table 1 - Icelandic Landings $^{ extstyle J}$ by Principal Species, January-March 1959 with Comparative Data							
Species		January-Mar	eh				
Species	1959	1958	1957				
Cod	74,566 8,424 1,171 3,304 16,667 2,785 2,061 102 1,283	(Metric Tons 85,673 10,543 2,268 5,121 4,792 3,032 3,615 1,422 1,459	74,338 9,271 1,590 2,838 2,585 2,478 1,779				
Total							

As of April 30, or about ten days before the official end of the winter season, actual production of frozen fish fillets was 1 percent below the April 30 level of 1958. Production of salted fish and stockfish was 8 percent and 9 percent, respectively, below the level of the same period in 1958. Because a higher proportion of the late season catch is being used for stockfish, it is likely that the final stockfish production will be somewhat higher than last year. And because catches held up at the end of the season better than usual, it is still possible that total groundfish production may equal or exceed that of last year.

Table 2 - Icelandic Production of Groundfish Products, January-April 1959 with Comparative Data					
Product		January-Apr	ril		
rioduct	1959 1958 1957				
Salted fish	21,000 4,400	TonsProdu 22,910 4,830 34,635	ct Weight) 19,670 2,970 27,150		

Total landings for January-March this year of 110,363 metric tons were smaller than for the same period last year, but considerably higher than in 1957 (96,363 tons). For most species except ocean perch, the catch as of March 31, 1959, was no higher than at the same time during the relatively poor catch year of 1957. But the situation improved dramatically in April, and the freezing plants in Faxa Bay and the Westman Islands were often working in shifts through weekends and holidays.

The Icelandic otter trawlers have been at some disadvantage this year by being excluded from fishing within the new 12-mile limit for the areas and times when inshore fisheries are most attractive. But they were less affected by the adverse weather. Despite the loss of the Hafnarfjordur trawler Juli, which foundered in a storm on the way home from Newfoundland in February, the total trawler catch for the first three months exceeded that of last year. During February and March the trawlers fished mostly off the West and South coasts. In April several trawlers moved to the cod fisheries off the Greenland coast, and an increasing number are now returning to the rich ocean perch grounds north of Newfoundland, where as much as 25 tons have been taken in a single haul of the trawl. Indications are that catches are just as good as last fall, and since the trawling on these new grounds started much earlier than last year, there may be a real problem in finding sufficient markets, other than the U.S.S.R., for the vastly increased volume of ocean perch.

But for the adverse weather in February and March it is most probable that the production of fish for the first four months would have been well above last year. Catches in Faxa Bay in January, before the storms forced the boats to port, were one-third higher than last year, and catches were on the whole excellent for the boats in April, particularly at the Westman Islands. While trawlers caught a larger share of the total catch for the first 3 months, the month of April saw a rise in the motorboats' share. In the home fishing grounds, the trawlers had definitely poorer catches thanlast year, due largely to the 12-mile limit.

At the level of lkr. 247 millions (US\$15.2 million), Iceland's exports for the first quarter of 1959 were 28 percent higher than in the comparable period of 1958. This was a delayed dividend from last year's record fish catch, which left yearend stocks of export products at a level lkr. 71-million (US\$4.4 million) higher than at the end of 1957. For the most part, these stocks were composed of frozen fillets from the heavy catches of ocean perch from the newly-discovered fishing grounds north of Newfoundland. Since the 1958 sales contract with the U.S.S.R. had already been fulfilled in November, it was necessary to store the fillets until a new sales contract could be negotiated with that country.

In both 1958 and 1959 the annual sales contract with the U.S.S.R. was not concluded until February, but this year the Icelandic merchant ships got off to an early start on their deliveries and were actually en route when the agreement was signed.

The sharp increase in exports to the Soviet Union, which were 47 percent higher than for the first quarter of 1958, was thus due to the factors of accumulated stocks and earlier deliveries; it provides no indication of a similar increase in the annual rate of exports. On an annual basis, exports to the U.S.S.R. are likely to be little changed. Although the 1959 contract provides for 26,000 tons of frozen fillets, compared to 25,000 tons in 1958, the fact that the Russians agreed to take a much larger proportion of the contract in ocean perch (23,000 out of 26,000 tons, compared to 11,000 out of 25,000 tons last year) means that more cod will be available for sale to Free World markets, where the demand for ocean perch is limited.

In the case of sales to the United States, however, the increase in January-Warch 1959, which was 43 percent above exports for the first quarter of 1958, appears to be due to fundamental market factors. The demand and prices have continued strong, and with a relatively poor season for the Canadian fisheries in the North Atlantic, the Icelanders are hopeful of maintaining the present high level of exports to the United States. The bulk of the first quarter increase in shipments to Russia came from year-end stocks, but virtually the whole of the increased shipments to the United States came from the new winter season 1959 catch.



Iran

DEVELOPMENT OF SHRIMP FISHERY IN PERSIAN GULF:

A large expansion of an Iranian company's shrimp fishing activities was announced earlier this year. The Iranian company before the expansion operated two shrimp fishing vessels, one mothership, and a 300-ton cold-storage warehouse in Khorramshahr. The company ships about 40 to 60 metric tons of shrimp a month to the United States. A New York City importing firm has sole importing

Iran (Contd.):

rights in the United States for the shrimp shipped by the Iranian company.

The expansion includes the addition of seven trawlers and one mothership to the Iranian company's fleet. The trawlers in May were on the high seas, riding "piggy-back" on steamers. Four were scheduled to arrive at Khorramshahr on May 28, and three on June 5, 1959. The mothership will arrive in August. The trawlers are 65 footers, having a displacement of 50 tons, and are equipped with Diesel engines. The additional mothership is 1,000 tons gross registry and is equipped for freezing and processing.

The additional trawlers were previously used in Panamanian waters. They are under Panamanian registry and will continue to fly the flag of Panama, at least for a year. The mothership, the Mayon I, is a United States-built vessel now under Guatemalan registry. The trawlers are owned by a Panamanian company which is associated with the New York City importing firm. The vice-president of the New York City firm said that shrimp fishing off Panama has been declining and that this is one reason for the transfer of the vessels to the Persian Gulf.

In addition to co-managership, the New York City importing firm has exclusive rights to the sale of the Iranian company's shrimp production except in Iran and Kuwait, states a May 23, 1959, United States Embassy dispatch from Tehran.

Note: Also see Commercial Fisheries Review, January 1959, p. 67.

Japan

ALBACORE LOIN SALES INCREASING:

According to figures of the Japanese Frozen Foods Exporters Association, tuna loin sales in April and May amounted to 350 tons (215 tons of albacore, 135 tons of yellowfin). There has been a rapid increase in sales of albacore loins, and the price has risen considerably above the check price of \$730 a ton f.o.b.

The latest price was \$780 to \$800 a ton f.o.b. (Nikkan Suisan Tsushin, June 8, 1959.)

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ATLANTIC TUNA FISHERY TRENDS:

Beginning the latter part of 1958 the Japanese started fishing tuna commercially in the Atlantic Ocean, principally in the South Atlantic. A Japanese newspaper report states that there are 37 or 38 Japanese vessels fishing in the Atlantic Ocean for tuna, according to the Japanese Export Frozen Tuna Fisheries Association. The vessels land their catches directly in European and Latin American countries, and a large quantity is transshipped to the United States from Latin American countries. In April about 3,000 metric tons were landed in Italy (2,000 tons) and Yugoslavia (1,000 tons) at \$285 a ton. The shipment to Yugoslavia was the first of several which are to continue during the sardine season that began in May and ends in November.

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EXPANDING EXPORTS OF FROZEN TUNA TO COUNTRIES OTHER THAN THE U. S.:

A large Japanese fisheries company has already been exporting frozen tuna by direct fishing boat landings in Cuba, Greece, and elsewhere. Its No. 1 Zenko Maru which made a landing in Greece in April, is reported to have put in at Marseilles, on the Mediterranean coast of France, on June 1, and it is thought that she may have succeeded in opening France to direct export of frozen tuna.

It is also reported that another Japanese company has sent its No. 25 Koko Maru into the harbor of Tripoli, in Libya, North Africa, to land about 300 tons of frozen tuna there for the first time.

It is considered certain that the fish (mostly yellowfin) were sold at a price of around \$290 landed. Because the United States market has been inactive lately, and there has been a large percentage of rejects on fish transshipped to the United States, it is thought that there will be a tendency to increase direct exports to Europe and Africa in the near future. (Nikkan Suisan Tsushin, June 8, 1959.)

Japan (Contd.):

EXPORT PRICE DROPS FOR FROZEN YELLOWFIN TUNA:

The export price for frozen tuna in Japan early in June dropped to the check price or floor price level of \$220 for 20-to 80-pound yellowfin. According to reports, the drop was the result of the lower prices reported on the United States west coast during the past few months. But no export sales at the \$220 f.o.b. price have been confirmed.

Another effect of the falling price is that Japanese tuna transshipped through foreign ports, which were contracted for when prices were higher, are lately being subjected to a high rate of rejects by the buyers in the United States, the Japanese report. Japanese frozen tuna traders are particularly perturbed by reports that transshipped gilled-and-gutted tuna, which have not been the target of many rejects hitherto, are meeting with rejects as high as 20 percent when delivered in the United States.

Meanwhile, the Japanese trade is also troubled by depleted stocks of canned albacore for the United States market in the face of a summer albacore season that does not seem to be able to get started. The small lots of albacore that are being landed are selling ex-vessel as high as \$360 a metric ton. Unable to find albacore, the boats are landing unusually large quantities of skipjack, which, as it is reportedly too fat for "katsuobushi" makers, is being bought by canners at \$110 to \$170 a metric ton.

Early in September 1958, the Japanese reported that the export price of frozen yellowfin tuna had dropped from its mid-August 1958 peak of \$300 a ton f.o.b. Japan for 20-80 pound "clipper" (ship-frozen) fish. By the end of August 1958, the price was down to \$270 for "clipper" fish and \$260 for ice-boat fish. Frozen skipjack tuna prices also dropped from a mid-August 1958 peak of \$215 for 15-pound fish to \$180 for 7-10 pound, \$190 for 10-15 pound, and \$200 a ton for fish over 15 pounds early in September 1958.

For the first five months of this year, export prices fluctuated only slightly be-

low or above the prices that prevailed in the autumn-winter of 1958 until early this June (1959) when the prices dropped to the check-price level.

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EXPORTS OF MARINE PRODUCTS TO THE UNITED STATES, 1957 AND 1958:

During 1958, Japanese exports to the United States of all marine products (frozen and canned fish, marine oils, and miscellaneous items) of 130,412 metric tons were valued at US\$67.5 million, an increase of 31.2 percent in quantity and 15.4 percent in value, as compared with 1957. Frozen tuna exports (62,190 tons) to the United States in 1958 were valued at about US\$19.0 million, an increase of 20.4 percent in quantity and 25.7 percent in value over 1957. Exports of all fishery products and marine oils were higher in 1958 as compared with 1957, except for canned crab meat exports, which declined 10.0 percent in quantity and 6.5 percent in value.

Japan's Exports of Marine Products to the United States, 1957 and 1958				
Item	Quantity		Value	
	1958	1957	1958	1957
	(Metric Tons)			
Tuna, frozen	62, 190	51,629	18,973	15,098
Tuna, canned	13,727	12,870	11,754	11,538
Crab meat, canned	2,547	2,829	5,816	6,219
Other canned	19,590	16, 370	15,644	13,524
Other fish & shellfish .	16, 465	13,370	9,391	8,601
Fish & marine	i .	· .		
animal oils	15,893	_2,363	5,962	3,546
Total all marine				
products	130,412	99,431	67,540	58,526
Pearls, natural &				
cultured	-		9,047	8, 185

In addition to the marine products mentioned, a substantial amount of natural and cultured pearls was shipped to the United States.

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EX-VESSEL ALBACORE TUNA PRICE AT RECORD HIGH:

In mid-June, which in normal years would be the peak of the season, baitboat albacore landings in Japan were still running at the low ebb of around 100 metric tons a day, and the ex-vessel price was rising steadily. On June 13 at Shimizu the price hit 170 yen a kilogram (US\$430 a short ton), the highest in recent years. For export frozen the price would have to be \$470 a short ton in order

to break even. Since the present export price is barely \$360, the freezers have no chance of buying at all. Calculating back from a frozen tuna export price of \$360, the ex-vessel price should be about 125 yen a kilogram (\$316 a ton) for baitboat fish and 135 yen (\$340 a ton) for frozen long-line fish. But the canners are saying that if they have to buy baitboat fish at 170 yen a kilogram (\$430 a ton), they can buy ship-frozen long-line fish at 165 yen (\$417 a ton). Consequently the freezers are also having trouble getting any ship-frozen albacore. It appears that if present conditions continue, it will be impossible to fill more than about half of this year's 30,000-ton export quota for frozen albacore. (Nikkan Suisan Tsushin June 15, 1959.)

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FISHERIES TRENDS IN HOKKAIDO AREA:

Because of a severe decline in various traditional fishing resources in the coastal areas of Hokkaido, a great change has taken place in the Hokkaido fishing industry in postwar years. Between 1929-1944, the bulk of the catch was herring, sardines, and anchovy, which abounded in nearby offshore waters. Herring production, which was 500,000 tons in 1933 has shrunk to less than one-tenth of that figure; anchovy production, even greater in some years, has declined to one-twentieth. The fishermen of the Island have been able to support themselves only by going farther out to sea in motorized fishing craft, and concentrating on salmon, salmontrout, groundfish, squid, and mackerel. The total catch of these species is several times larger than in the prewar years.

Profitable distant sea-fishing grounds are in the Sea of Okhotsk and near the Soviet-occupied Kurile Islands where, however, Japanese fishermen have been in recent years faced with the problem of seizure and detention by Soviet authorities. Annual negotiations between Japan and the Soviet Union setting restrictions on the catch of salmon, crab, and other fish and any future negotiations concerning fishing grounds are of great

concern to the Hokkaido fishing population whose average income is reported to have dropped to 58 percent of the preware figure.

Hokkaido still produces 26 percent of Japan's total supply of fishery products. Salmon accounts for one-quarter of the value of the catch which, beside varieties mentioned above, includes cod, flatfish, scallop, and seaweed. The value of the 1958 production landed in Hokkaido was US\$87 million, according to a May 18 dispatch from the United States Consulate in Sapporo.

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INCREASE IN REJECTS IN FROZEN ATLANTIC TUNA DE-LIVERIES TO CALIFORNIA CANNERS:

With the softening of the United States market for tuna, the frozen yellowfin market in Japan has also been gradually softening. The f.o.b. price of frozen yellowfin tuna was reported to be as of June 10 about \$225, close to the check price of \$220 a short ton. At the same time the claims or rejects in California on transshipments from the Japanese Atlantic tuna fishery are increasing, bringing headaches to the Japanese industry.

There are at present about 35 or 36 Japanese vessels fishing in the Atlantic, and in April and May they transshiped 3,985 short tons of yellowfin at \$235-\$245 f.o.b. Lately, however, it is said that claims have increased to as high as 30 percent. Some Japanese trade quarters strongly suspect that these are "market claims" resulting from the good United States landings of yellowfin and the softening of the canned tuna market, reports the United States Embassy in Tokyo. (From Suisan Keizai Shimbun of June 10, 1959.)

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LIBERAL LANDINGS OF SMALL YEL-LOWFIN TUNA AT SHIMIZU HARBOR:

A total of 76 metric tons of small yellowfin tuna from local grounds was landed at Shimizu, in Shizuoka Prefecture, Japan, on May 28. This was the first such landings of the year. The fish were from 20 to 45 pounds, in good condition, and they sold for the fresh trade at 400

to 822 yen per kilogram (about US\$1,000 to US\$2,000 a short ton). These fish were caught by purse-seiners. The schools are reported plentiful in the vicinity of Mikurashima. Many seiners from the Shimizu and Kozu areas have gone after them, and it is expected that landings will continue. (Report from the United States Embassy in Tokyo, based on Nippon Suisan Shimbun, June 3.)

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LIGHT LANDINGS OF SUMMER ALBACORE TUNA CAUSE PRICE RISE:

The Japanese summer albacore season as of June 9, 1959, still had not been able to get started, and landings as of that date amounted to only a little over 2,000 metric tons. As a result the exvessel price climbed day by day, and at Yaizu on June 8 it finally reached 150 yen a kilogram (about US\$380 a short ton), astonishing the trade.

Buying is, of course, all by canners for export to the United States, and the freezers seem to have completely given up any idea of buying summer albacore. Even if the price rise stops at 150 yen, the canners are saying that they cannot break even unless the price per case of white meat tuna for export to the United States is raised by at least \$2 a case over that of the last selling period of the Canned Tuna Sales Company (which was \$9.50 f.o.b. Japan).

Packers in the Shimizu area have begun packing albacore from the summer albacore fishery, but landings as of the early part of June continued poor and the ex-vessel price ranged from 125 to 150 yen a kilogram (US\$315-380 a short ton).

Skipjack ex-vessel prices are also around \$200 a ton, and the canners are operating in the realization that they are going to take a loss as the break-even point on albacore for export is around 100 yen a kilogram (US\$252 a short ton), reported the United States Embassy in Tokyo from Nikkan Suisan Tsushin of June 9 and Suisan Keizai Shimbun of June 6.

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MARINE OILS PRODUCTION, FOREIGN TRADE, STOCKS, AND CONSUMPTION, 1957-1959:

Production of edible marine-animal oils by Japan in 1958 amounted to 138,314 metric tons, an increase of 20.3 percent from the 124,325 tons produced in 1957, and a slight decrease from the forecast production of 140,315 tons for 1959.

Japan's Production, Foriegn T	and and S	to also of	Marino
Animal Oils,			vialine
Annual Ons,	19591/	1958	1957
	(10	letric To	ns)
Edible Marine Oils:			
Production by type:			
Cod-liver oil 2/	4,280	4,230	
Shark-liver oil $2/\ldots$	1,650	1,500	1,807
Other liver oil $2/\ldots$	250	265	265
Fish-body oil	24,040	29,980	23,437
Whale oil	110,095	102, 339	84,803
Total	140,315	138, 314	115,017
Imports all types	1,500	1,495	357
Stocks of all types			
on Jan. 1	15,021	14,435	8,951
Total Supply	156,836	154,244	124, 325
Exports	90,400	91,761	25,668
Inedible Marine Oils:			
Production:			
Sperm oil	34,290	39,896	31,778
Imports	-		
Stocks, beginning			
of year <u>2</u> /	2,834	5,019	4,808
Total Supply	37,124	44,915	36,586
Exports	9,940	16,471	49,104
1/ Forecast.			
2/ Stocks held by processing fa	actories.		
			

Japan's imports of both edible or inedible marine oils is negligible. Exports of edible marine oils (mostly whale oil) in 1958 were up sharply from 1957 and the predicted exports for 1959 will be up (1.4 per cent) slightly from 1958.

Production of inedible oils (sperm oil) in 1958 increased about 25.6 percent from 1957, but production of sperm oil in 1959 is predicted to drop 14 percent below that for 1958.

The 16,471 tons of sperm oil exported in 1958 was down sharply (66.5 percent) from the 49,104 tons exported in 1957. The forecast for 1959 indicates a further drop of 39.7 percent from the 1958 total.

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NEW VESSELS BEING ADDED TO TUNA FLEET:

On June 5, 1959, the Japanese Fisheries Agency granted construction permits

for a number of tuna boats, among them a 239-gross-ton live-bait boat, a 245-ton bait boat, a 450-tonlong-liner, a 409-tonlong-liner, and three 95-ton tuna boats.

In addition, a Japanese company recently ordered a 680-ton (gross tonnage) tuna boat. Construction cost will be about 210 million yen (about \$583,000). The vessel will have a 1,300-horsepower Diesel engine. It was expected to be started in July and is scheduled for completion in November.

A Japanese whaling company is moving into the tuna fishery because there are no further chances for expansion in salmon fishing and whaling. The company sent its first boat, the No. 3 Akitsu Maru (240 tons), to sea in mid-May to fish the western Pacific. The company's second tuna boat, the 240-ton No. 5 Akitsu Maru, was scheduled to sail on her maiden voyage on June 11. Both of the vessels were bought from other owners, but the company's building two new boats, one of 1,000 tons and one of 500 tons. Scheduled for completion in October, these new vessels will make one trip to the Indian Ocean, and then will be sent to the Atlantic. The company intends to build or buy two more tuna boats of 350-450 tons.

Also Miyazaki Prefecture's new highseas fishery guidance vessel, the Miyazaki Maru, sailed on June 9 on her maiden voyage to conduct fisheries guidance and exploratory fishing on southern Pacific tuna grounds. (Nikkan Suisan Tsushin, June 5, 6, & 8, 1959.)

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NORTH PACIFIC FACTORYSHIP SALMON AND KING CRAB FISHERIES TRENDS:

The Japanese Fisheries Agency announced on June 15 the catch of salmon and king crab by North Pacific factoryship fleets as of June 10. The salmon catch to that date was 19,700 tons. The Sea of Okhotsk crab pack was 149,359 cases, and the crab pack by the Tokei Maru fleet in the eastern Bering Sea was 45,769 cases. In all cases, the record was better than last year's. The 16

salmon fleets began operations on May 21 and 22, and by June 10 their catch was about 1,000 metric tons above that of last year at the same time, thus making up completely the 10 days' delay in leaving port. Water temperatures are much higher than last year, all species show signs of being more abundant, and pinks in particular show indications of a regular oddyear high in abundance. The Okhotsk and eastern Bering Sea crab operations had packed by the end of May more crab than at the same time last year by 30,000 cases and 10,000 cases, respectively.

The Canned Salmon Joint Sales Company has made tentative contracts with United States packers for early shipment of 40,000 cases of pink talls, as much as possible to be shipped by the end of June. Japanese land cannery production has lagged, however, particularly of the comparatively unprofitable tall cans, and it was considered that at best only about 20,000 cases could be shipped by the end of June, the remainder being carried over to July. At present the company has consignments equivalent to about 40,000 cases of 96 No. 2 cans, of which only about 8,000 cases are talls.

Of the 19,700 tons of salmon caught as of June 15, red salmon totaled 6,195 tons (36.87 percent), chums 10,200 tons (53.76 percent), and pink salmon 1,650 tons (8.91 percent). The average catch per fishing boat was 15.21 tons of reds, 22.17 tons of chums, and 2.67 tons of pinks, for a total of 40.05 tons per boat.

The Japanese-Soviet Fisheries Commission finally decided on a catch quota of 85,000 metric tons of salmon for the Japanese fleets within the treaty area north of 45° N. longitude on May 13. On May 15 the fleets--16 motherships and 460 fishing boats--sailed for the grounds, and deliveries of fish to the motherships began on May 22. Reports indicate the general pattern of the catch resembles that of 1957, a high year in the cycle of salmon abundance. Deliveries to the motherships have been running 70 to 100 tons a day, somewhat better than last year, and catch rates are 4 to 6 fish per shackle of net. As of early in June fishing was reportedly concentrated between 165° E. and 171° E., at 46°-47° N.

The Japanese Fisheries Agency decided to divide the catch quota between the mothership fleets and the Hokkaido land-based fishery in the same proportion as last year, giving 70,831 tons to the mothership fleets (154 tons per catcher boat) and 14,169 tons to the land-based boats. Licenses on this basis were formally granted the mothership operators on May 26, and the fishing boats' licenses were sent off to the grounds on a transport on May 27.

The price dispute between mothership companies and fishing boat owners, which threatened briefly to delay the sailing, is still unsettled. The fishermen, claiming that each boat needs on the average of at least 17.5 million yen (US\$48,600) to cover expenses, started with a demand for a 25-percent price increase. This would bring reds up to 370 yen (US\$1.03) from last year's 315 (87.5 U.S. cents per fish), chums to 175 (48.6 cents) from 125 (34.7 cents), pinks to 95 (26.4 cents) from 78 (21.6 cents), and silvers and kings to 260 (72.2 cents) from 210 (58.3 cents). The companies countered with an offer of a 6.3-percent price increase plus various lump-sum adjustments. The two sides were reported to be gradually approaching a compromise.

It is reported that Soviet patrol boats are unusually active on the fishing grounds, constantly checking the Japanese catcher boats' gear and the distance between their nets. (Nikkan Suisan Tsushin, June 10, 12, and 16, 1959.)

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PLAN TO EXPORT FISH CANNED FOR PET FOOD TO U. S. PET FOOD PACKERS:

The Japanese are planning to pack fish for pet food in large cans for export to United States canners of pet food. Estimates indicate that about 400,000 cases of fish for pet food will be shipped to the United States by the end of this year as compared with the 150,000 cases exported last year.

Prices for export f.o.b. Japan range from ¥900 (US\$2.50) a case for all dark

meat and about ¥950-980 (\$2.70) a case for 50-percent dark-meat pack.

It is expected that the packing of fish for pet food to be used by United States pet food packers as an ingredient in their own pet food will increase. Most of the fish for pet food is now being packed in the Shizouka district, but interest is indicated also in this type of industry in Hokkaido, Sanriku, and Choshi districts.

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PLAN TO REDEPLOY SALMON BOATS TO OTHER FISHERIES:

The Japanese Fisheries Agency and the Japan Salmon Fishermen's Federation began on May 29 to assemble and consider data on measures to be taken in connection with the reorganization of the North Pacific salmon fishery, and particularly the large-scale anticipated reduction in the number of salmon fishing boats. These discussions will serve as a basis for determining the redeployment of the salmon fishing boats into tuna fishing, trawling, or salmon gill-net fishing outside the Soviet-Japanese treaty area.

Present movements in connection with the large-scale reduction in the number of salmon boats are that the Japan Salmon Fishermen's Federation is hoping for Government compensation for those leaving the fishery and for a change-over to tuna boats of the 250-ton class. Not all of the boats would change to tuna fishing, as many as possible being redeployed into trawling and into salmon fishing south of the treaty line. But the salmon fishermen would like to have as many as possible allowed into tuna fishing, at the same time having the Government make better efforts to weed out the prefectural "research vessels," which now number about 40 and catch around 24,000 tons of tuna a year. On the other hand, the Federation of Tuna Fishermen's Cooperative Associations is expressing strong opposition to any government policy of redeploying salmon boats into the tuna fishery. The Shizuoka Prefecture Tuna Fishermen's Association has made representations on this account to Prime Minister Kishi, but the local tuna fishermen's associations in the north-eastern part of

the country are not showing any such strong opposition. (Nikkan Suisan Tsushin, June 1, 1959.)

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SIXTH ROUND OF CANNED TUNA SALES FOR EXPORT TO UNITED STATES:

The Tokyo Canned Tuna Sales Company held June 3-5 its sixth round of canned tuna sales for United States export during this export year. Only light meat was offered--110,000 cases (25,000 cases each of 7-oz. and 13-oz. cans, and and 60,000 cases of 2-kg. or 4.4-lb. cans.) There will be no change in price, and shipment is to be made from June to August.

Of the 250,000 cases of white meat sold in the fifth round of sales for United States export, about 140,000 cases remained to be shipped in June. According to trading company sources, the market for exports to the United States appears rather strong because of short supplies. Because of the poor Japanese summer albacore catch, United States packers are having trouble buying raw material, and the price of fish is rising, according to the Japanese.

The opinion of the Japanese trade is that the export price for white meat canned tuna for the United States must soon be increased, and in view of the going exvessel price of 140 yen per kilogram (US\$353 per short ton) for albacore tuna, the Japanese packers are strongly of the opinion that an increase of around \$1 a case would be completely inadequate. (United States Embassy in Tokyo from Nikkan Suisan Tsushin, June 3, 1959.)

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SKIPJACK TUNA VESSEL PRICE DROPS:

Large landings of skipjack tuna were being made every day late in May and early in June at the Onahama market in Fukushima Prefecture, and on June 3 the ex-vessel price dropped to 25 yen a kilogram (about \$63 a short ton). Small 2-kilogram (4.4-lb.) fish sold for 50 yen (14 U. S. cents) apiece. Landings were

22 tons on May 31, 35 tons on June 1, 101 tons on June 2, and 106 tons on June 3.

The skipjack were taken by pole-andline and by seiners. At first they were sold at \$125 to \$150 a short ton ex-vessel, but the successive days of heavy landings brought the price down to the \$63-\$100 level of June 3. The fish are being shipped fresh within the prefecture and in neighboring prefectures to feed farmhands working at rice transplanting, and are also being taken by driers and canners.

The main pole-and-line fishing ground is 200 to 300 miles east of Cape Nojima in Chiba Prefecture, while the seiners are fishing about 20 miles off Onahama. About 80 seiners from this and other prefectures have assembled at the Onahama base. (Suisan Keizai Shimbun, June 9, 1959.)

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SUMMER ALBACORE FISHING CONTINUES POOR:

Japanese tuna fishermen continued to report poor fishing for summer albacore tuna as of the early part of June. Shimizu, a leading Japanese tuna port, reported no improvement in landings and canners of that city have almost given up hope of packing any substantial quantity of summer albacore tuna this year. Only a little over 600 metric tons (or less than 20 percent of a normal year) have been landed at Shimizu from March 24 (when the first landing of poled tuna was reported) until May 25.

However, skipjack landings have been heavy and tuna packers are packing that species since the ex-vessel or landed price is reported reasonable. Japanese canners report that to pack albacore tuna at prevailing prices means a loss of about 55 U. S. cents a case, while packing a case of skipjack tuna at current prices means a profit of 55 U. S. cents a case.

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TUNA CANNERS HARD HIT BY ALBACORE SCARCITY:

The failure of the Japanese summer albacore fishery is dealing heavy blows

to both canners and freezers in Japan. The canners, in particular, are hard hit because they are trying to fill the quota for export to the United States. The canners, who judge that it will be extremely difficult to fill their production quotas with purchases of bait-boat albacore alone, are beginning to show an interest in buying shipboard-frozen long-line fish, which has hitherto been monopolized by frozen tuna exporters. The only indication of this trend is the purchase of a small lot by a company at Yaizu on June 10 at US\$353 a short ton, and an earlier purchase by another company. (Nikkan Suisan Tsushin, June 11, 1959.)

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TUNA INDUSTRY TRENDS AND PROBLEMS:

When the new Japanese export year began in April, the fisheries trade press was filled with news of conferences to set export quotas and prices for tuna products and to decide the allotment of export business among the producers. There are reports of trouble for Japanese tuna abroad, and movements within the other Japanese fisheries are bringing pressure upon established operators to permit newcomers to enter the tuna mothership field.

On tuna loin and disk exports, the Japanese freezers are reported to have agreed on a 3,000-ton quota for 1959, the same as in 1958, but they are said to be having difficulty in deciding how to allot this quota among the producers. Furthermore, it appears that they have been having trouble selling the 1958 quota, with only 1,394 tons sold to the end of January. Consequently they were moving early in April for a price cut of 10 percent, which would bring the check price for yellowfin loins to \$550 a short ton and albacore to \$720. The Japanese Fisheries Agency has reportedly been opposing the cut, for fear of stirring up new opposition to Japanese loin exports in the United States, but there were predictions that the Agency will go along with the industry's wishes.

Opposition to a Japanese company's plans to establish canneries in connection with its tuna base projects in Singapore and Penang continues among tuna canners in Japan. On February 12 a group from the Tuna Export Canners Association visited the Fisheries Agency and asked that the overseas base plans be stopped because of possible bad effects on the canned tuna export trade with the United States. The authorities reportedly have not committed themselves on the question, and want the industry associations concerned to work out the problem with Kaigai Gyogyo.

The Southeast Asian tuna base projects of the Japanese company mentioned in the previous paragraph may also be a factor in the Japanese Fishery Agency's decision to seek power to apply to the medium-size (under 100 tons gross) tuna boats the same kind of regulations that currently limit the operations of large tuna boats. These new regulations will tighten up requirements for permission to increase the tonnage of such vessels and will require them to seek special permission to land tuna abroad. It is explained that when the present regulations were drawn up, it was not anticipated that boats of this size would be based anywhere but in Japanese ports; however, the Japanese company's Singapore plans and other similar projects envision the operation of smaller Japanese tuna boats from bases in foreign countries.

It is reported that the Japanese Frozen Tuna Export Association has tentatively set a quota of 12,000 tons for the Italian trade, 8,000 tons to be allotted on the basis of past performances, and 4,000 tons for special allotment. The Italian exports this year must all be on a barter basis, and the problem is that there seems little chance of arranging enough barter to cover the planned quantity of frozen tuna.

There is reportedly a strong possibility that the production quota for canned tuna for export to the United States will be set at 2.5 million cases for the 1959 export year. On the basis of demand, it is considered reasonable that this will be 65 percent white meat and 35 percent light meat, but it is doubtful that the raw material supply situation will make this ratio possible. Shipped exports (as opposed to landings of fish abroad from fishing boats) of frozen yellowfin tuna to the United States in 1959 have reportedly been set at 35,000 short tons. Discussions are being carried on over whether to sell the fish through individual exporters, as at present, or through a joint sales company. It is anticipated that the former method will be used, because of opposition from clipper operators to the joint sales company idea.

Landings of tuna in Central American and Caribbean ports for transshipment to United States packers reportedly have been hit by reject claims ranging as high as 30 or 40 percent. The high reject rate is mostly for the fillets, which are from large yellowfin.

One of the developments that is arousing great interest in tuna circles is a move by salmon and saury fishermen in northern Japan, particularly Hokkaido, to get permission from the Fisheries Agency to enter the mothership tuna fishery. The saury fishery seems to grow more unprofitable as catches grow bigger, so these fishermen are seeking permits that will enable them to spend a good part of the year fishing tuna. Two large companies are said to be interested in operating motherships, and Hokkaido salmon boat owners have set up a Hokkaido Tuna Fishery Association with about 60 boats that they would like to get into tuna mothership fleets. The number of salmon and saury boats that already have part-time tuna fishing licenses is reportedly 224, but the terms of their licenses would have to be changed in order to enable them to join tuna mothership operations. Last year tuna mothership fleets took about 15,000 short tons of fish, of which 12,000 were taken by the one large company's vessels and the balance by another company.

A Japanese tuna boat reported sighting the Soviet vessel Nora fishing tuna in the Caroline Islands. A Russian fleet was reported on the saury grounds off northern Honshu, and Russian boats were seen on the mackerel grounds west of Kyushu.

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ULTRASONICS USED TO LOCATE SALMON IN NORTH PACIFIC:

A transmitter and a receiver, which the Japanese suspend over the side of the vessel at a depth of 1.5 meters (about 5 feet), record the movement and the density of fish schools and the depths in the sea at which they occur. During daylight the fish were usually at depths between 30 and 50 meters (98-164 feet), but toward dusk they rose to shallow depths.

Fish schools concentrate in the deep-scattering layer--pelagic organisms concentrate in layers throughout all oceans at varying depths and rise toward the surface at night. The fish captured in that layer were satiated with Euphausia, small shrimp-like crustaceans. When the deep-scattering layer was near the surface, the fish catches improved and the water became less transparent. The large abundance of plankton, the passively floating or weakly swimming animal and plant life, caused the decline in transparency.

The Japanese believe their equipment, which they are trying to improve, will lead to improved fishing methods. If they can use this technique on a large scale, they will improve materially their salmon catch, without increasing the present expenditure of effort.

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VESSEL TO FISH FOR TUNA FROM ARGENTINA:

A Japanese fishing company is sending the Yoshino Maru to Argentina for tuna fishing.

The company, which is carrying on tuna fishing out of Argentina, received a report early in June that the fishing grounds off Argentina are good, with catches of around 1,000 kan (about 4 short tons) a day. The same company had earlier dispatched the 300-ton (gross) Eisei Maru to Argentina and because of its success the company is considering sending the 700-ton Yoshino Maru. The attitude of Argentine authorities was being checked and if favorable, the vessel was scheduled to sail in mid-July.

Tuna fishing in Argentina is carried on in the Atlantic from Mar del Plata. Yellowfin and bluefin tuna are landed there and used for canning to meet local requirements. Demand is said to be increasing.

Fishing arrangements with Argentina were initiated in the era of President Peron, but thereafter, because of political unrest they did not go smoothly. Last year around October the project finally started to function, and it is said that the Argentine government is adopting policies of positive aid to the fishery. (Nippon Suisan Shimbun, June 3, 1959.)



Korea

FISHERIES DEVELOPMENTS, MAY 1959:

A ceremony was held on May 12, 1959, at Pusan, Korea, to mark the formal transfer of one 80-ton purse-seine vessel and one 70-ton carrier, procured under the fisheries development project of the In-

ternational Cooperation Administration to the new owner. These boats were the third and fourth received of seven fishing boats being built abroad under the fisheries program. These boats were commissioned and put to sea immediately. On May 25, 1959, the seiner was reported to have caught nearly 3,500 boxes of fish (about 100 tons) during the first 10 days at sea making it the high production boat by mid-June.

Following delay due to bad weather, shrimp fishing got under way along the south and west coast about mid-May and Pusan processors began receiving shipments shortly thereafter. The Central Fisheries Inspection Station reported that about 40,000 pounds of Korean east coast shrimp were frozen for export under the new inspection regulation between mid-March and May 1. Practically all of this amount has been shipped.



Malaya

JAPANESE-MALAYAN COMPANY TO PRODUCE FROZEN AND CANNED TUNA:

A Japanese fisheries company held its regular stock-holders' meeting on May 29 and discussed a report on a Malayan-Japanese company which is to be established at Penang. The company is a joint venture of the Japanese company and Chinese businessmen in Malaya. The meeting to establish the new concern was scheduled for the end of June in Penang.

The company will be capitalized at ¥60 million (US\$167,000), of which the Malayans will invest 51 percent and the Japanese 49 percent. There will be 5 Japanese officers and four Malayans, the president to be Malayan. In addition to an existing cannery, freezing (5-ton capacity) and cold-storage (166-ton capacity) facilities are to be built within 8 months of the time the capital is paid in. Contracts to purchase fish will be made with 5 Japanese boats. Production plans call for landings of 1,621 tons of tuna for freezing and 1,188 tons for canning in oil. Exports of canned tuna to African and Asian countries and to Europe will be about 59,900 cases; 14,000 cases will be sold to the Malayan armed forces; and

Malaya (Contd.):

2,000 cases on the local market. Landings of about 400 tons will be made for the fresh and salted fish trade. (Nikkan Suisan Tsushin, May 30, 1959.)



Mexico

WEST COAST SHRIMP FLEET TIED UP OVER PRICE DISPUTE:

On May 16, 1959, a dispute over prices between fishermen's cooperatives and vessel owners on the West Coast of Mexico tied up the shrimp fleets in the various ports. The East Coast cooperatives, recognizing the difficulties the boat owners are undergoing, settled for a one year period ending May 15, 1960, with an increase to cover only the cost of social security. This amounts to 165 pesos a metric ton for large shrimp and 105 pesos for small. This is about US\$12.00 and \$7.64, respectively, a short ton with the break between large and small at 31-35 count headless.

The cooperative fishermen (the catching of shrimp in Mexico is restricted to fishermen belonging to cooperatives) on the West Coast are asking for a 25-percent increase. The boat owners are willing to concede an increase of 15 percent providing that one crew member is eliminated. The normal complement on West Coast of Mexico shrimp vessels is seven men and on the East Coast five.

At one stage of the negotiations the boat owners offered to sell all boats, shore installations, and transportation equipment to the cooperatives. However, agreement could not be reached as to the method of payment. (United States Embassy dispatch of May 21, 1959, from Mexico.)

SHRIMP PRICE DISPUTE BEING SETTLED:

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The dispute over the price to be paid Mexican shrimp fishermen on the West Coast during the 1959/60 season in open waters starting September 16 (season closed July 16 through September 15)

appeared to be well on the way toward settlement late in May 1959. One organization with operations in Topolobampo and Culiacan, Sinaloa, and in Saline Cruze, Oaxaca, reached agreement with the cooperatives on May 22, 1959, and it was expected that similar agreements would soon be reached with the remaining West Coast cooperatives.

The agreement calls for a guaranteed headless shrimp price of 2,600 pesos (about US\$208.00) a metric ton, and under current prices an additional 400 pesos (US\$32.00) to be paid the fishermen.

If the market price for shrimp fluctuates, the fishermen will share at the rate of 15.4 percent in the fluctuations, with a guaranteed minimum price of 2,600 pesos. At present prices the fishermen will receive about US\$43.92 more for each metric ton of headless shrimp landed-an increase over the 1957-59 fishermen's price of about 2 U. S. cents a pound.

In addition, the fishermen will be permitted to bring in one-half ton of fish each trip. The cooperatives plan on selling the fish in Mexico City, and other consuming centers at low prices, since no charges will be assessed for catching the fish.

Fishing circles are of the opinion that the same arrangements will be made by the remainder of the West Coast boat owners, and that the seven-day strike that tied up two-thirds of Mexico's shrimp fleet is now over.



Morocco

PROBLEMS IN MARKETING FISHERY PRODUCTS:

The separation of the Moroccan franc from the French franc and the inauguration of the European Common Market have caused difficulties for the Moroccan fishing industry. However, the marketing problem was pressing even before the separation of the franc because of the declining world prices for sardines, the high cost price for Moroccan products, and the stiffened competition from Portugal.

It is estimated that the separation of the franc is costing the canners 535 million francs (about US\$1,009,000) this season. In addition, upon the inauguration of the European Common Market, the 10-percent reduction of custom duties was extended to other Organization of European Economic Cooperation countries so that Portugal, for example, gained 150 francs (US\$0.30) per case over Morocco in certain European Common Market countries. France, because of her commitments toward the Common Market will probably be obliged

Morocco (Contd.):

to abolish the 12,000-ton duty-free quota for Moroccan canned fish, and should this happen, it is hard to see how the fishery industry could survive. The cost price of Moroccan sardines is 4,000 francs (US\$8.16) per case. In France, because of the quota, the sale price is 6,000 francs (US\$12.24), but outside France only 3,400 francs (US\$6.94).

A bitter controversy has broken out between the canners and the frozen fish industry. The canners blame the latter for the marketing problem, claiming that frozen Moroccan sardines are canned in France and cut down the market for sardines canned in Morocco. The freezing industry believes that if it does not supply the fish, the Portuguese will and that the trouble with the canning industry is that their tins and oil are too expensive. It is pointed out that no great progress has been made since the export of beheaded frozen sardines was forbidden in 1958 and that 1.7 million cases of canned fish (about 1.4 million of which were sardines) remained unsold. An unsatisfactory compromise has been achieved and whole frozen sardines may now be exported in 5-kilogram (11-1b.) packages.

The boat-builders at Larache are idle and the northern fisheries are suffering from the loss of former markets in Spain. It has, in fact, been suggested that no new boats be built except to replace old ones so that there will be enough work for the existing fleet.

At Agadir, where over a hundred plants were once operating, 80 percent of the 1958 catch went into the manufacture of byproducts, fish meal, and fish oil. Because of the much lower price paid for sardines going to reduction plants—about 9 francs (about 0.8 U.S. cents) a kilo as compared to 28 francs (5.7 U.S. cents) for fish going to canneries—the fisherman's share of the profits went down from 245,000 francs (US\$486) in 1958.

Exports of shrimp, having mounted to 200 metric tons in 1958, are now falling off sharply. Large amounts of Egyptian and Scandinavian shrimp have brought the Morrocan shrimp price down.

If the fishery industry should fail, not only would some 20,000 fishermen and related workers be unemployed, but also other industries would be vitally affected, particularly can makers and olive-oil producers.



Netherlands

FIRST FACTORYSHIP ACQUIRED:

The Netherlands fishing fleet will acquire its first factoryship soon. It is the Van Ronzalen, a German trawler which will be reconditioned by a shipbuilder in Ijmuiden and then sent to Rotterdam, which will be the ship's base.

The factoryship will have a processing plant capable of producing 20 metric tons of fish fillets a day. (Boletin de Informacion, Sindicato Nacional de la Pesca, April 1959, Madrid, Spain.)



Nicaragua

SHRIMP INDUSTRY GROWING:

Although shrimp fishing in Nicaragua slowed down during the first quarter of 1959, it continues to be a growing industry. One United States firm asked for a concession to fish off the Caribbean shore and another firm asked for a concession to fish off both the Caribbean and the Pacific shores.

At the same time a French company, which asked for a concession to grow oysters in Laguna de Perlas north of Bluefields, was granted free entry privileges under the Industrial Development Law to bring into the country all the machinery necessary to process and pack fish and fish products. (United States Foreign Service report of May 28 from Managua.)



Peru

EXPORTS OF PRINCIPAL MARINE PRODUCTS,

JANUARY-APRIL 1959 AND YEAR 1958:
Exports of principal marine products

Exports of principal marine products by Peru during the first quarter of 1959 continued at a high rate. Comparable

Peruvian Exports of Principal Marine Products, Jan-April 1959 and Year 1958					
	JanApril		Year	19582/	
Marine Products	Quantity	Value	Quantity	Value	
	Metric	US\$	Metric	US\$	
	Tons	1,000		1,000	
Fish meal	51,058	5,936	105,777	11,635	
Fish (frozen,					
canned, etc.)	5,778	1,879	30,056	7,618	
Sperm oil	3,749	481	7,352	1, 103	
Fish oil	1,301	129	1,643	193	
Whale meal	998	117	1,295	127	
Fertilizer (guano)	405	34	$\frac{3}{15}$, 133	$\frac{3}{1}$, 270	
Whale oil			1,695	167	
Total	63,289		162,951		
1 / Values converted	t rate of 2	5 40 co	lee emiale	HS\$1 for	

 Values converted at rate of 26.40 soles equals US\$1 for first quarter of 1959.
 Values converted at rate of 23.30 soles equals US\$1 for year 1958.

3/ Quantity and value 9 mos. 1958.

data for the first quarter of 1958 are unavailable except for fish meal. The fish meal exports of 51,058 metric tons January-April 1959 were 30.4 percent higher than the 39,152 tons exported January-May 1958 (United States Embassy in Lima, May 25, 1959).



Somalia

DEVELOPMENT OF TUNA FISHERY SHOWS PROMISE:

During the September 1958-May 1959 tuna fishing season, the tuna cannery at Candala, Somalia, packed over 16,000 cases, the largest pack since it has been in operation. The cannery at Habo, Somalia, after a shutdown of three years reopened in April 1959 and up to mid-May packed 2,182 cases of tuna. Most of the fish have been caught by primitive methods (hand-line fishing from canoes) by Somali and Arab fishermen as there is only one boat in the area equipped with long-line gear, loaned to the Candala cannery owner by the International Cooperation Administration (ICA). However, authority has just been received from ICA to proceed with the construction of two 27-foot Diesel-powered fishing boats for demonstration purposes. At the same time the ICA Fisheries Advisor to Somalia has started classes to train Somali fishermen in the use of long-line fishing gear and other modern fishing methods.

With these steps being taken in the modernization of fishing, there is every reason to believe that the catches can be greatly increased and production multiplied several or many times over. Almost all of the pack is now exported to Italy, but a very rough market survey indicates there are excellent marketing possibilities for tuna and other fish products in other European countries, including the European Common Market in which Somalia may become a member, as well as in the Middle East and Africa. A Food and Agriculture Organization survey report recommended that the fishing industry was in the No. 1 position for both raw material and sale possibilities. A full scale survey of the fisheries potential of Somalia is now under consideration.

It is believed that a survey team should include an oceanographer and a marine biologist in addition to a fishing expert. It is further recommended that the survey should include not only the 180-mile north coast of Somalia on the Gulf of Aden, but also the long (1,150 miles) east coast of Somalia on the Indian Ocean.



Union of South Africa

PILCHARD-MAASBANKER LANDINGS, JANUARY 1959:

The Union of South Africa's west coast pelagic shoal fish catch for January 1959 (the first month of the 1959 season) was 10,451 metric tons of pilchards, 49 tons of maasbanker (jack mackerel), and 6,139 tons of mackerel. The total catch was 16,639 tons, according to the Union's Division of Fisheries. These figures compare with 7,690 tons of pilchards, 150 tons of maasbanker, and 3,142 tons of mackerel in January 1958, and 4,551 tons of pilchards, 605 tons of maasbanker, and 3,267 of mackerel in January 1957.

The January catch this year yielded 3,039 tons of fish meal, 141,609 gallons of fish-body oil, 1,364,079 pounds canned pilchards and maasbanker. (The South African Shipping News and Fishing Industry Review, March 1959.)

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PILCHARD-MAASBANKER LANDINGS, FIRST QUARTER 1959:

The South African Division of Fisheries reports that the landings from the Cape West Coast pilchard-maasbanker fishery in January-March 1959 amounted to 76,191 short tons as compared with landings of 57,640 tons in January-March 1958. The first quarter 1959 pilchard-maasbanker landings were made up of 71,043 tons of pilchard and 5,148 tons of maasbanker or jack mackerel. In addition, the nonquota mackerel landings rose sharply to 22,843 tons or 743 tons more than the entire catch for 1958.

It was predicted that Cape West Coast landings of pilchards, maasbanker, and mackerel in 1959 may establish a new record. The best landings of those species occurred in 1952 when about 300,000 tons were landed. In 1958 a total of 298,800 tons was landed for processing into fish meal, fish oil, and canned fish.

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RESEARCH ON SPINY LOBSTERS PLANNED:

The Oceana group of South African fishing companies in May 1959 announced Union of South Africa (Contd.):

plans to conduct its own research on the spiny lobster resources of the Cape West Coast. The research planned by this industry group of firms is expected initially to cost about £30,000-40,000 (US\$84,000 to \$112,000). A 67-foot fishing vessel will be modified to carry out the program for the benefit of the spiny lobster processors in Hout Bay, Lambert's Bay, Thorn Bay, Hondeklip Bay, and Port Nolloth.

The South African Division of Fisheries conducts extensive research on pelagic fish, but has not to date begun research on the spiny lobster in the Cape West Coast area. The Division, however, is conducting research on the spiny lobster in the Luderitz area.



U. S. S. R.

NEGOTIATING FOR FIVE NEW FACTORYSHIP TRAWLERS:

The Soviet Union is negotiating with a shipyard in Kiel, West Germany, for the delivery of five new factoryship trawlers, according to Dansk Fiskeritidende (May 22, 1959), a Danish fishery trade periodical. The five vessels will cost a total of about 75 million marks (US\$17.9 million). Previously, the same shipyard delivered 24 factoryship trawlers of the Pushkin type to the Soviet Union.

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FISHING FLEET OPERATING IN BERING SEA:

A Soviet fishing fleet has been reported operating in the eastern waters of the Bering Sea. As of April 27, a substantial portion of the Soviet fleet, including about 40 vessels, was working approximately 100 miles north of Unimak Island. By mid-May, much of the Soviet fleet had moved northward to the area between Unimak and St Matthew Islands.

The Soviet fleet has been operating in waters along the Arctic ice flow and has been moving northward as the ice field gradually recedes. Apparently the fleet

depends upon this ice field as a source of ice for preserving the catch, at least until it can be transferred from the fishing vessels to the large motherships.

There has been no evidence that the Soviets are using salmon fishing gear, nor is there evidence that the fleet is particularly interested in halibut. For the most part, the Soviet fleet appears to be operating entirely on bottom fish, paralleling very closely the operations of Japanese vessels in this area of the Bering Sea.



United Kingdom

CANNED TUNA PRICES, MAY 1959:

During May 1959, offerings of tuna or tuna-like fish on the British market were mainly bonito originating from Peru. Since the liberalization of canned salmon imports, sales of tuna have decreased and differences in c.i.f. quotations may be attributed to pressure on some of the canned fish importers to move stocks. Prices c.i.f. for one prominent brand early in May 1959 were as follows: solid pack in cottonseed oil (presumably bonito): 7-oz., 48 cans/case, 43s. (US\$6.02) a case; $3\frac{1}{2}$ -oz., 48 cans/case, 28s. (\$3.92) a case; another brand's prices were: 7oz., 48 cans/case, 50s. 11d. (\$7.13) a case; $3\frac{1}{2}$ -oz., 48 cans/case, 31s. 8d. (\$4.43) a case. Japanese solid pack whitemeat tuna $3\frac{1}{2}$ -oz., 48 cans/case, was offered at 35s. (\$4.90) a case.

Wholesale prices for canned tuna published by a British trade journal in May 1959 were as follows: solid pack (fancy quality), $3\frac{1}{2}$ -oz., 96 cans/case, 95s. 9d. (\$13.40) a case and 7-oz., 48 cans/case, 79s. 3d. (\$11.09) a case, select $3\frac{1}{2}$ -oz., 96 cans/case, 100s. (\$14.00) a case; and tunny in tomato sauce, $3\frac{1}{2}$ -oz., 14s. 2d. (1.98) a dozen cans. Retail prices: solid pack (fancy quality), $3\frac{1}{2}$ -oz., 1s. 2.5d. (17 U. S. cents) a can and 7-oz., 2s. (28 cents) a can; select, $3\frac{1}{2}$ -oz., 1s. 3d. (17.5 cents); tunny in tomato sauce, $3\frac{1}{2}$ -oz., 1s.6d. (21 cents) a can.

Canned tuna imported into United Kingdom enters under the heading "other canned fish" and exact figures on the imports

United Kingdom (Contd.):

of canned tuna and bonito are unobtainable. Total imports under that heading from January-November 1958 amounted to about US\$3,572,800. Of that amount, Peru supplied US\$1,498,000 and Japan supplied US\$484,400. All of those imports are probably tuna because of restrictions on other imports included in the category.

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IMPORT CONTROLS ON CANNED FISH:

Controls on the import of many consumer goods from the Dollar Area were removed by the United Kingdom effective June 8, 1959. Included among the commodities freed of controls are canned fish, according to a news release transmitted by the United States Embassy in London (May 27, 1959). The British press release points out that the effect will be a further substantial reduction in discrimination in the operations of import controls against Canada, the United States, and the rest of the Dollar Area. Imports of canned fish in the future will receive the same treatment as imports from Western Europe, i.e. freedom from control.

Import controls on canned salmon only were removed by Britain on September 17, 1958.

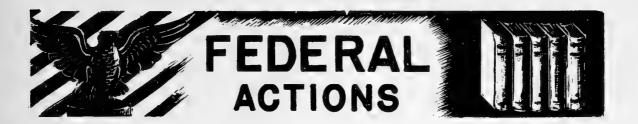


FISH FLOUR

Research on the production of a neutral fish flour in South Africa is traced as far back as 1937. Two researchers investigated methods of producing a neutral fish flour which could be added to cereal starch foods, without influencing their taste or smell. One of the first issues of the South African Shipping News (February 1946) described the progress made and in 1951 the same publication reported that a completely neutral fish flour with a protein content of more than 85 percent had been produced from white fish.

Large-scale production of the flour might, however, have been affected by comparatively limited supplies of white fish meal and so for several years the South African Fishing Industry Research Institute worked on a process for producing the flour from the more abundant pilchard and maasbanker. This work was encouraged by the Union Government which hoped to increase the protein diet of South Africa's people by adding fish flour to bread and to mealie meal.

Eventually in September 1954 The South African Fishing News reported that the Fishing Industry Research Institute had developed a "commercially adaptable process for the production of fish flour from a cheap and abundant fish." A plant was installed in a factory at Dido Valley near Simonstown and soon a neutral fish flour, with a protein content of about 80 percent, was being produced on a commercial scale. Tests conducted by the South African Department of Nutrition showed that enriched bread could take up to eight percent of fish flour without having its taste, smell or color affected. This enriched bread, with about two percent fish flour, is now sold throughout the Cape Western Province and the Dido Valley plant has produced nearly 1,000 tons of neutral flour from pilchard and maasbanker meal.



Department of the Interior

FISH AND WILDLIFE SERVICE

BRISTOL BAY ALASKA SALMON FISH-ING GEAR REGISTRATIONS ANNOUNCED:

The total number of units of gear registered for use in the salmon fishing districts of Bristol Bay were announced by the U. S. Bureau of Commercial Fisheries on June 22, 1959. As published in the Federal Register of June 23, the number of units registered by district as of 6 p.m. Friday, June 19, 1959, were as follows:

Kvichak-Naknek 150 units Nushagak 293 units Egegik 60 units Ugashik 50 units

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FISHERY ATTACHE PACT SIGNED:

On May 5, 1959, Assistant Secretary Scott of the Department of State and Assistant Secretary Leffler of the Department of the Interior signed a document establishing a fisheries and minerals attache program.

The agreement spells out the responsibilities of each Department in selecting attaches, the duties of the attaches, and the methods for instructing attaches as to the types of reporting required from abroad on developments that affect the United States fishing and minerals industries.

At present, there are two fishery attaches—one in Mexico City as Regional Fisheries Officer for Latin America, and one in Tokyo as Fisheries Attache for Japan. The Bureau has requested that the Department of State establish four additional regional posts to cover other strategic fishing areas of the world. The

posts recommended will be at the Oslo, London, Lisbon, and Bangkok Embassies.



Treasury Department

BUREAU OF CUSTOMS

DECISIONS ON AIRTIGHT CONTAINERS MAY INCREASE IMPORT DUTY ON SOME PACKAGED FISHERY PRODUCTS:
Recent decisions by the U. S. Bureau of Customs hold that frozen rainbow trout and fish fillets, packaged in a certain manner, are packed in airtight containers, and therefore dutiable under Tariff Paragraph 718(b) at 12-1/2 percent ad valorem. Previously they were dutiable at a 1/2 cent a pound in the case of whole frozen trout, and 1-1/2 cents a pound for frozen fillets other than groundfish, under Tariff Paragraph 717. These two decisions may be applied to frozen fish fillets and other products that are imported in cellophane, polyethylene, and cryovac, and other modern packaging materials. The decisions read as follows:

Treasury Decision 54826 (47): Fresh or frozen trout, beheaded or eviscerated or both, but not further advanced, are classifiable under 718(b), Tariff Act of 1930, when packed in airtight containers (whether polyethylene, cellophane, cryovac bags, or other containers completely sealed so as to be impermeable to air), weighing with their contents not over 15 pounds each, or if not in airtight containers as fresh-water fish under 717(a).

Treasury Decision 54802(13): Bag made from a sheet consisting of a layer of cellulose nitrate-coated cellophane and a layer of polyethylene in such a way that the inside of the bag is polyethylene only, three edges joined by heat sealing, a fish filet inserted, and the top also heat-sealed, is an airtight container for the purposes of 718(b). If the same fillet is placed in an open container or "boat" overwrapped in cellophane and waxed paper and sealed in such a way that air can pass in and out, the overwrapped "boat" is not an airtight container for the purposes of 718(b).

The two decisions did hold that the products submitted were in airtight containers and therefore that the containers were impermeable to air. The trout was packed in cryovac; the fillets were packed in what is called a poly-cell bag or cellulosefilm bag. The classification by the Bureau of Customs is being protested by the American Seafood Distributors Association and a determination as to impermeability to air will in due course be made by the Customs Court in the future. In the meantime, packers and importers of all fishery products, using the modern packaging methods, must make a decision on future shipments, shipments on the water, purchase contracts, etc., otherwise they will find that what they thought would be dutiable at from a 1/2 cent to 1-1/2 cents a pound is going to be assessed at the rate of 12-1/2 percent ad valorem.

The Bureau of Customs makes no statement of a criteria for impermeability to air. They provide no additional information on the decisions than is contained in the summaries. They will decide each case as it is presented. Possible interpretations of criteria are as follows:

 All cryovac containers and all containers packed under vacuum will be considered to be airtight containers, and dutiable at 12-1/2 percent.

- The heat-sealed polyethylene bag, not packed under vacuum, and not of an abnormal thickness, and consisting of one layer only, that is used by so many fishery firms, will not be considered to be an airtight container, and dutiable at the lower rate.
- 3. A bag or sack made of a combination of materials, such as cellophane and polyethylene, or made from a sheet of more than one layer or of an abnormal thickness, whether or not packed under vacuum, will be considered to be an airtight container, and dutiable at the 12-1/2 percent rate.

The determination of airtightness is made as to the immediate container—the container that immediately surrounds the fish. In the case of bagged trout or bagged fillets, which are in turn packed in a master carton, the bag is the immediate container. That the master carton is cardboard, overwrapped with cellophane, is not important in this determination, if within the master carton are individual containers. The one-pound fillet packages, packed in a cardboard box overwrapped in cellophane, will probably be considered non-airtight.

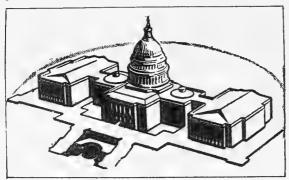
In a discussion with Bureau of Customs officials on June 11, 1959, the National Fisheries Institute was advised that, "contrary to general opinion" the Bureau's recent decisions regarding airtight containers made from films (polyethelene, cellophane, cryovac, etc.) will not adversely affect the duty classification of fishery products to the extent believed by the industry.

Fishery products packaged in film of single thickness is not considered airtight by the Bureau of Customs, nor is multiple thickness packaging considered airtight if the bags are NOT heat-sealed. If the open end of a bag is stapled, for instance, it is not considered airtight.



Eighty-Sixth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to



committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.

ALASKA OMNIBUS ACT: The President on June 25 signed into law H. R. 7120, to amend certain laws of the United States in light of the admission of the State of Alaska into the Union (P. L. 86-70). The legislation is largely technical providing changes in Federal laws, necessary because of the change in Alaska's status from Territory to a State, eliminating inappropriate references in Federal statutes. Other provisions are substantive, terminating certain special Federal programs in Alaska, and enabling participation by Alaska in other programs on "an equal footing with other States." The bill was drafted by the executive agencies concerned with the administration of Federal responsibilities in Alaska. Two provisions are of particular interest to fisheries interests: (1) Alaska will assume jurisdiction over its fish and wildlife resources the first day of the calendar year following expiration of 90 calendar days (instead of 90 legislative days) after certification by the Secretary of the Interior that the Alaska State Legislature has made "adequate provision for the administration, management, and conservation of the fish and wildlife resources of Alaska in the broad national interest." (The Secretary of the Interior made the certification on April 20, 1959. The transfer, therefore, will be effective January 1, 1960, unless Congress adjourns before the 90 days provided for in the bill.); (2) authorizes the President to transfer to Alaska without reimbursement property used in a function taken over in whole or part by the State.

BONNEVILLE REORGANIZATION ACT OF 1959: A draft of proposed legislation entitled "A bill to amend the Bonneville Project Act, as amended," was transmitted with an accompanying paper from the Under Secretary of the Interior to both Houses of Congress on June 18; referred to the respective Senate and House Committees on Public Works. The proposed reorganization, among other things, would provide that the Bonneville Power Corporation set up would try to coordinate its programs with fish and wildlife preservation and propagation.

The Subcommittee on Flood Control of the Senate Committee on Public Works conducted hearings July 15, 16, and 17 on S. 1927, to establish a Bonneville Power Corporation. Among other purposes, the bill provides that the Corporation would be responsible for carrying out the policies of the Federal Government for comprehensive multiple-purpose water resources development and to coordinate its programs in relationship to other agencies including those for fish and wildlife preservation and propagation.

COLUMBIA RIVER FISHERIES INVESTIGATION: The House Committee on Appropriations on June 2 ordered favorably reported H. R. 7509, the Public Works Appropriation Bill 1960 Fiscal (House Report No. 424). Included in the Committee recommendations were appropriations for the Corps of Engineers and Bureau of Reclamation for water resource construction programs.

The House Committee, however, rejected requests of Columbia River state conservation agencies and private conservation interests for an appropriation of \$450,000 to begin an intensified program to resolve the problem of preserving and restoring fisheries in the face of an expanded dam

building program which is rapidly destroying remaining runs of sea-run fish. The fishery program, which had been developed and approved by the Columbia Inter-Agency Committee, proposes comprehensive research into techniques and methods for perpetuating these sport and commercial fisheries. Funds made available under it would be used by State fish and game agencies and the U. S. Fish and Wildlife Service.

The Committee questioned increases requested by the Fish and Wildlife Service for its cooperative Federal-State Columbia fisheries development program. It approved an appropriation of \$1.2 million for construction and \$1.7 million for operation of facilities to compensate for fisheries losses that result from river development while stating in its report that it "... has no intention of permitting the Federal water resources construction program in the Northwest to become the vehicle through which this section of the country enjoys more than its reasonable share of federal funds available for regular fish and wildlife preservation work..."

The Committee also repeated its argument that river basin studies of the Fish and Wildlife Service should be financed by transfer funds from the Corps of Engineers and Bureau of Reclamation, but neither the Bureau or the Corps included monies in their budget requests for these purposes.

H. R. 7509 passed the House June 9. The Senate Appropriation Committee reported H. R. 7509 on July 8 (Senate Report No. 486). The bill was passed by the Senate July 9. The Corps of Engineers was granted planning money for four dams within the Snake River drainage which have been strongly opposed by conservationists and state and federal wildlife agencies. This includes: \$770,000 for Bruce's Eddy on the North Fork of the Clearwater River; \$450,000 for Little Goose lock and dam, \$800,000 for Lower Monumental lock and dam and \$200,000 for Lower Granite lock and dam, all on the lower Snake River. Each of these projects will impede movements of sea-run Chinook salmon and steelhead trout into spawning waters of the Middle Snake River System. Except for the funds recommended for the Lower Granite project, the same amounts were approved in the version of the bill that passed the House June 9.

The Senate voted appropriations of \$750,000 to finance River Basin Studies programs of the Bureau of Sport Fisheries and Wildlife. Earlier the Bureau of the Budget had requested that \$836,400 be provided for this purpose through direct appropriation in the Department of Interior and Related Agencies Appropriation Bill. But following the rejection of this request by both the House and Senate, the restoration of the \$750,000 in the Public Works Bill represents the recovery of a substantial part of the funds that are needed to determine the effects of river development programs on fish and wildlife and to compensate for losses to these resources. Language, written into the bill in three different places, specifically earmarks funds for Fish and Wildlife Service studies, investigations and reports: \$500,000 is provided under the "Coordination Act Studies" general construction item for the Corps of Engineers; \$50,000 is designated under the general investigations item for the Corps of Engineers and \$200,000 under general investigations for the Bureau of Reclamation. In each place language in the bill provides that "wildlife conservation shall receive equal consideration and be conducted with other features of water resources development programs."

The Senate also recommended that \$280,000 be included in the Bureau of Reclamation item for fish and wildlife studies in connection with the Missouri Basin Project. This was the amount recommended by the Budget Bureau but denied by the House which, along with the \$750,000 for other River Basin Studies programs, is subject to approval by House Conferees in House-Senate Conference Committee since the House bill did not contain these funds.

The Senate approved the budgeted figures of \$1.2 million for construction, and \$1.7 million for operation and maintenance of the Lower Columbia River Fish Sanctuary program, the same amounts as provided in the House bill. No funds were included in the measure to launch the proposed intensive research program of the Columbia Inter-Agency Committee on the problem of preserving and restoring Columbia River fisheries in the face of expanded dam-building activities which are rapidly destroying remaining runs of sea-run fish.

Senate asked for a conference July 9.

House Report No. 424, Public Works Appropriation Bill, 1960 (June 2, 1959, 86th Congress, 1st Session, Report of the House Committee on Appropriations to accompany H. R. 7509, a bill making appropriations for the civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority, for fiscal year ending June 30, 1960), 32 pp., printed. Contains budget estimates and Committee recommendations. Included are certain tabulations of projects for which funds are recommended for both planning and actual construction and reductions in budget estimates, comparative statement of appropriations for 1959, estimates for 1960, and Committee recommendations.

Senate Report No. 486, Public Works Appropriation Bill, 1960 (July 8, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Appropriations to accompany H. R. 7509, a bill making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority), 49 pp., printed. Contains budget estimates, House allowances, and Committee recommendations. Included are tables showing by State, rivers, harbors, and flood control construction projects; comparative statement of appropriations for 1959, estimates for 1960, allowances by House, and Senate Committee recommendations.

COLOR ADDITIVES IN FOODS: H. R. 7624 (Harris), a bill to protect the public health by amending the Federal Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerances) under which such additives may be safely used; to the Committee on Interstate and Foreign Commerce; introduced in House June 9. The proposed legislation would expedite the testing of colors to determine safe levels of use by requiring color

manufacturers to do the appropriate research and to submit the results to the Food and Drug Administration. All types of color additives would be subject to the safety requirements of the new law, not merely "coal-tar colors" as under present regulations. The proposed bill would replace the present "coal-tar color" provisions in the Federal law enforced by the Food and Drug Administration and was introduced as a regulatory measure to insure safe use of color additives in foods, drugs and cosmetics.

Also S. 2197 (Hill and Goldwater); to the Committee on Labor and Public Welfare; introduced in Senate June 17. Identical to H. R. 7624.

DOGFISH SHARK ERADICATION: H. R. 7759 (Pelly), a bill to amend the act providing for a program to investigate and eradicate the predatory dogfish sharks on the Pacific coast in order to expand such a program; to the Committee on Merchant Marine and Fisheries; introduced in House June 16. Similar to S. 1264 and related bills previously introduced which provide for extension and expansion of the dogfish shark eradication program on the Pacific Coast, but while S. 1264 provides for an incentive payment for dogfish, H. R. 7759 provides for finding ways and means of eradicating or controlling dogfish.

H. R. 7759 provides for determinations of the effects of dogfish removal upon commercial and noncommercial species of fish, the level of fishing intensity required to reduce depredations of these sharks on the fishing grounds, locations of their concentrations and migration routes, the value of chemical repellents as control agents, and possible commercial uses of the dogfish shark that are killed as a result of the control program. Chartered vessels would be used in these experimental studies. Cooperation with Canada also would be sought.

Dogfish Shark Eradication: Hearings May 22, 1959, before the Merchant Marine and Fisheries Subcommittee, Senate Committee on Interstate and Foreign Commerce, 86th Congress, 1st Session, on S. 1264 (a bill to amend the Act providing for a program to eradicate the dogfish shark on the Pacific coast in order to expand such program), 46 pp., printed. Contains purpose and provisions of the Bill, legislative background, testimony, and recommendations by State, Federal, and industry representatives. Also includes Pacific Coast Dogfish Shark Committee's review report "The Menace of the Dogfish Shark on the Pacific Coast," with accompanying tables, illustrations, figures showing areas of concentrations, and Committee recommendations

The Senate Committee on Interstate and Foreign Commerce on June 17 ordered favorably reported S. 1264, to amend the Act providing for a program to eradicate the dogfish shark on the Pacific coast in order to expand such program, with amendments (S. Rept. 411). The bill amends the Act entitled "An Act authorizing and directing the Secretary of the Interior to investigate and eradicate the predatory dogfish sharks to control the depredations of this species on the fisheries of the Pacific coast, and for other purposes," approved September 2, 1958 (72 Stat. 1710). Would extend the program from a "four year" to a "five year" period; would provide incentive payments to fishermen with re-

spect to dogfish shark carcasses (not to exceed \$15 a ton) or dogfish livers (not to exceed 15 cents a pound); and increases funds to implement the program from \$95,000 to \$325,000.

Senate Report No. 411, Bounties on Dogfish Sharks (June 22, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce to accompany S. 1264), 7 pp., printed. Contains purpose and provisions of the bill, discusses sharks, predator control, and gear damage; indicates proponents and opponents, appropriations; presents agency comments and changes in existing law.

 $\underline{\text{H. R.}}$ 7891 (Westland) introduced in House June 22; similar to S. 1264.

S. 1264 Amendments, intended to be proposed by Senator Bush to bill S. 1264 (Magnuson), to amend the Act providing for a program to eradicate the dogfish shark on the Pacific coast in order to expand such a program; ordered to lie on the table and to be printed; introduced in Senate June 23. Would provide amendments to S. 1264 to expand the dogfish shark eradication to include a 1-million-dollar program for the eradication or control of starfish in Long Island Sound and adjacent waters.

The Senate on July 6 passed with amendments and cleared for the House S. 1264, to expand the program to eradicate the dogfish shark in Pacific coastal waters.

As passed by the Senate the dogfish shark eradication provisions were passed without amendment to the bill as reported from the Committee on Interstate and Foreign Commerce (S. Rept. No. 411). The Senate agreed to add as an amendment a new section to the bill providing for a 1-million-dollar program for the eradication or control of starfish and to amend the title of the legislation to read: "A bill to amend the Act providing for a program to eradicate the dogfish shark on the Pacific coast in order to expand such program, and to provide for the development and carrying out of an emergency program for the eradication of starfish in Long Island Sound and adjacent waters."

DUMPING RESTRICTIONS IN COASTAL WATERS: H. R. 8058 (Dorn), a bill to aid navigation and protect the fishing industry by prohibiting the dumping of certain materials in the coastal navigable waters of the United States; to the Committee on Public Works; introduced in House July 1. Provides amendments to the Oil Pollution Act of 1924, as amended, to prohibit the discharge of ferrous sulfate, ferric hydroxide, ferric oxide, or sulfuric acid into or upon the coastal navigable waters from any vessel, and for other purposes.

DUMPING RESTRICTIONS IN NEW YORK HARBOR AND ADJACENT WATERS: H. R. 8078 (Dorn), a bill to aid navigation and protect the fishing industry in waters adjacent to New York City by prohibiting the dumping of certain materials in such waters; to the Committee on Public Works; introduced in House July 1. Provides amendment to the Act entitled "An Act to prevent obstructive and injurious deposits within the harbor and adjacent waters of New York City, by dumping, or otherwise, and to punish and prevent such offenses," approved June 29, 1888, as amended (33 U. S. C., sec. 441).

Would prohibit the placing, discharging, or depositing by any process or in any manner of (1) refuse, dirt, ashes, cinders, mud, sand, dredgings, sludge, acid or any other matter of any kind, other than that flowing from streets, sewers, and passing therefrom in a liquid state, in the tidal waters of the harbor of New York, or its adjacent or tributary waters, or in those of Long Island Sound, within the limits which shall be prescribed by the supervisor of the harbor; or (2) of ferrous sulfate, ferric hydroxide, ferric oxide, or sulfuric acid, other than that flowing from streets, sewers, in waters with respect to which a permit for the discharge overboard of oil or water containing oil would not be granted by the supervisor of the harbor, is strictly forbidden. The bill further provides for penalties consisting of fines, imprisonment, or both for violation. One-half of any fine imposed shall be paid to the person or persons giving information leading to conviction.

FISHERIES ASSISTANCE ACT OF 1959: The Subcommittee on Fisheries and Wildlife of the House Committee on Merchant Marine and Fisheries on July 8 met in executive session in consideration of H. R. 5421, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes.

FISH HATCHERIES: The House Committee on Merchant Marine and Fisheries on July 9 ordered favorably reported to the House H. R. 2398, to provide for the establishment of a fish hatchery in northwestern Pennsylvania (H. Rept. No. 654).

FISHERY PRODUCTS INCLUDED IN FOOD-ALLOTMENT PROGRAM: Food Distribution Programs: Hearings June 4, 5, and 8, 1959, before a Subcommittee of the Senate Committee on Agriculture and Forestry, 86th Congress, 1st Session on S. 489, S. 585, S. 663, S. 862, S. 1884, and S. 2098. (Bills to facilitate the distribution of surplus food products to needy families in the United States, to safeguard the health, efficiency, and morale of the American people, to promote the full use of agricultural resources, and for other purposes), 225 pp., printed. Contains purpose and provisions of bills, statements, reports, and recommendations of representatives of Government and industry; individual views and comments on legislation; and various tables and charts. S. 585 provides for inclusion of fish among items in "basic food-allotment" provisions of the program.

FISHING VESSEL CONSTRUCTION SUBSIDIES: S. 2338 (Engle and Magnuson), a bill to provide a program to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic and competitive status, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate July 7. Provides for a differential subsidy in the construction of new fishing vessels of up to $33\frac{1}{3}$ percent, and in exceptional cases up to 50 percent. Would also provide authority to the Secretary of the Interior to acquire obsolete or inadequate fishing vessels in connection with construction of a new replacement vessel. Related to \underline{H} . \underline{R} . $\underline{5421}$ and bills previously introduced which, a \overline{mong} \overline{other} purposes, provide for fishing vessel construction subsidies.

The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce July 9 conducted hearings on S. 2338.

FISHING VESSEL MORTGAGE INSURANCE FUND ACT: S. 2342 (Magnuson, Smathers, and Engle), a bill creating a Federal Fishing Vessel Mortgage Insurance Fund, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate July 8. Would create a Federal Fishing Vessel Mortgage Insurance Fund which shall be used by the Secretary of the Interior as a revolving fund for the purpose of carrying out the ship mortgage provisions of title XI of the Merchant Marine Act, 1936, as amended, as it applies to fishing vessels under the Fish and Wildlife Act of 1956 (70 S. T. 1120). Further provides that if at any time funds are not sufficient to pay any amount the Secretary of the Interior is required to pay on ship mortgage insurance on fishing vessels he may issue notes or other obligations to the Secretary of the Treasury as may be necessary.

FISH AND WILDLIFE AID THROUGH EQUIP-MENT TRANSFER: H. R. 7730 (McIntire), a bill to amend section 203 of the Federal Property and Administrative Services Act of 1949 to provide that surplus personal property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; to the Committee on Government Operations; introduced in House June 15. Similar to H. R. 7190 and related bills previously introduced which provide for change in existing laws to include State Fish and Game Departments among State agencies eligible for receipt by transfer of surplus Federal Government property and equipment for use in furthering their wildlife conservation, restoration, and educational objectives.

Also H. R. 7904 (Derwinski) introduced in House June 23, and S. 2270 (Gruening) introduced in Senate June 24; to the respective House and Senate Committees on Government Operations. Similar to H. R. 7190 and related bills previously introduced.

Special Subcommittee of the Senate Committee on Government Operations scheduled hearings to begin on July 29 on bills providing for expansion of the donable property program authorized under the Federal Property and Administrative Services Act of 1949, to other public agencies or organizations. Includes legislative bills which would include State Fish and Game Departments among agencies eligible for receipt by transfer of surplus Federal Government property and equipment for use in furthering wildlife conservation, restoration, and educational objectives.

FISH AND WILDLIFE COOPERATIVE TRAIN-ING UNITS: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings July 1 on H. R. 5814 and related bills providing for cooperative unit programs of research, education, and demonstration between the Federal Government, colleges and universities, the several States and Territories, and private organizations, and for other purposes.

FOOD MARKETING: The Chairman of the Federal Trade Commission on June 29 transmitted to the Congress, pursuant to law, an interim report on "Economic Inquiry into Food Marketing" (with accompanying papers); referred to the respective House and Senate Committees on Interstate and Foreign Commerce.

GULF COAST FLORIDA SHRIMP BOAT HAR-BORS SURVEYS: A letter from the Secretary of the Army was presented in the House on June 23. transmitting a letter from the Chief of Engineers. Department of the Army, dated May 29, 1959, submitting a report, together with accompanying papers and illustrations, on a review of reports on and surveys of Gulf Coast shrimp boat harbors in Florida, requested by resolutions of the Committee on Rivers and Harbors, House of Representatives, and from the Committee on Public Works, U. S. Senate, adopted June 28, 1946, and February 14, 1950. Also submitted in response to five other congressional authorizations listed in the report (H. Doc. No. 183); referred to the Committee on Public Works.

IMPORTS OF POLLUTED SHELLFISH PRO-HIBITED: H. R. 7754 (Colmer), a bill to amend the Public Health Service Act to provide for certain investigations and studies by the Surgeon General of the United States; to the Committee on Interstate and Foreign Commerce; introduced in House June 16. Provides for investigations and studies of sanitation control maintained by foreign countries relating to harvesting and preparation of shellfish for the purpose of determining whether such controls meet the minimum standards prescribed for shellfish shipped in interstate commerce in the United States. Imports of shellfish from countries which fail to meet the minimum sanitary controls would be prohibited. The Surgeon General would promulgate regulations, establish procedures relating to sanitary control, and make available the names of foreign countries which comply with prescribed standards.

INSECTICIDES EFFECT UPON FISH ANDWILD-LIFE: The Subcommittee on Fisheries and Wild-life Conservation of the House Committee on Merchant Marine and Fisheries held hearings July 1 on H. R. 5813 and related bills dealing with the effect of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife and for other purposes.

INTERIOR DEPARTMENT APPROPRIATIONS: The President on June 23, 1959, signed into law H. R. 5915, fiscal 1960 appropriations for the Department of the Interior, and related agencies (P. L. 8660). Included are funds for the Fish and Wildlife Service and its two Bureaus.

INTERSTATE TRANSPORTATION OF FISH: The House Committee on Merchant Marine and Fisheries on July 9 ordered favorably reported to the House H. R. 5854, a bill to clarify a provision in the Black Bass Act relating to the interstate transportation of fish, and for other purposes (H. R. 653). Provides a technical amendment to the Black Bass Act clarifying that only shipment of legally taken fish is covered by the Act.

LAND TRANSFER: S. 2211 (Butler), a bill to provide for the conveyance to the State of Maryland of a tract of land located on the campus of the

University of Maryland, College Park, Maryland, which was previously donated by the State of Maryland to the United States; to the Committee on Interior and Insular Affairs; introduced in Senate June 18. Involves Federal lands exclusive of that portion on which the Bureau of Commercial Fisheries Technological Laboratory is located.

MARINE MAMMALS PROTECTION ON HIGH SEAS: H. R. 8164 (Saylor), a bill for the protection of marine mammals on the high seas, and for other purposes: to the Committee on Merchant Marine and Fisheries; introduced in House July 9. Provides for protection of walrus, polar bear, and sea otter on the high seas for conservation, management, and other purposes.

OCEANOGRAPHY: S. Res. 136 (Magnuson, Engle, and Jackson) relative to research on ocean-ography and the report of the Committee on Ocean-ography to the President; to the Committee on Interstate and Foreign Commerce; introduced in Senate June 22, 1959.

Whereas expanded studies of the oceans and the ocean bottoms at all depths are vital to defense against enemy submarines, to the operation of our own submarines with maximum efficiency, to the rehabilitation of our commercial fisheries and utilization of other present or potential ocean resources, to facilitating commerce and navigation, and to expand our scientific knowledge of the waters covering 71 per centum of the earth's surface, life within these waters, and phenomena which affects climate and weather; and

Whereas several other nations, particularly the Union of Soviet Socialist Republics, are presently conducting oceanic studies of unprecedented magnitude on a worldwide basis, utilizing larger, more numerous, and more modern ships and more scientific and supporting personnel than ever before; and

Whereas a Committee on Oceanography, comprised of eminent scientists from universities and nongovernmental institutions, appointed by the National Academy of Sciences-National Research Council, has prepared a report outlining objectives and recommending a comprehensive program of oceanographic research to be carried out at nominal cost over a period of ten years; and

Whereas the Office of Naval Research of the Department of the Navy, observing that there has been no effort to improve the Nation's research fleet in the past fifteen years, and that there is need for more oceanographic scientists, laboratories, specially designed ships and shore facilities, has prepared a report recommending a ten-year, long-range program for oceanographic research which has been approved by the Chief of Naval Operations; and

Whereas the Coast and Geodetic Survey of the Department of Commerce, directed by statute to conduct hydrographic surveys, seismological investigations, magnetic and gravimetric observations, and other scientific operations, but restricted generally to coastal waters and limited in its work in these waters by obsolescence of its research ships, has drawn up plans to rehabilitate its scientific vessels and broaden the area in which it can operate, subject to departmental and Bureau of the Budget approval; and

Whereas the Bureau of Commercial Fisheries of the Fish and Wildlife Service of the Department of the Interior, faced with a drastic diminution of a valuable food supply and resource and an actual decline of ships and facilities for fisheries exploration and research at a time when Soviet Russia, Communist China, Japan, and many other nations are expanding fisheries research intensively, has a plan, which still waits departmental and budget approval, to replace its present small and overage vessels over a ten-year period: Now, therefore, be it

Resolved, That the Senate --

- (1) commends the report of the Committee on Oceanography to the President, the Bureau of the Budget, and to the heads of the five departments and nine agencies which would participate in the ten-year program of oceanographic research recommended by the Committee, for their study and consideration with a view to overcoming this Nation's lag in this scientific field, and urges their support of a comprehensive plan that will assure the United States permanent leadership in oceanographic research;
- (2) commends the programs of the several agencies for rehabilitating their research facilities and enlarging their oceanographic activities to the President and the Bureau of the Budget for like study and consideration with the object of developing a well-balanced and coordinated expansion of scientific effort in this vital field:
- (3) concurs in the recommendations of the Committee on Oceanography that--
 - (a) basic oceanographic research be immediately expanded and at least doubled within the next ten years;
 - (b) in the field of applied research fisheries exploration be intensified, migratory patterns investigated, greater attention given to genetics of fish and other marine organisms, biological surveys augmented utilizing new devices, a program on diseases and other toxic effects in the marine environment established, comprehensive studies made of the economic and legal aspects of commercial fisheries, especially in relation to other industries, and research stimulated on the nature of organisms in the sea on which marine life of commercial or sports value feeds;
 - (c) training of more oceanographic scientists in private educational and research institutions be encouraged and facilitated by the National Science Foundation and the Office of Education with the object of doubling the number of oceanographers at the doctor of philosopy level during the next ten years;
 - (d) systematic ocean-wide and ocean-deep surveys be conducted by the Coast and Geodetic Survey and Hydrographic Office, Bureau of Navigation, Department of the Navy, to develop much broader knowledge of depths, salinity, temperature, current velocity, wave motion, magnetism and biological activity;

- (e) research fleets of the various agencies and institutions engaged in basic or applied oceanographic research, of which most of the vessels are old and obsolete, be replaced by modern ships adapted to ocean-wide scientific studies and furnished with advanced scientific equipment, and that the number of ships be increased 90 per centum within the next ten years;
- (f) shore facilities commensurate with an expanded program of basic research be constructed in order to derive maximum knowledge from observations and collections made at sea;
- (g) development and utilization of deep-diving manned submersibles be expedited to facilitate maximum accomplishments in both basic and applied oceanographic research at all depths;
- (h) mineral research be undertaken on the ocean floor with a view to present or ultimate utilization of the untapped resources that lie beneath the ocean; and
- (i) extensive scientific investigations be made on the effects of radioactivity in the oceans including the genetic effects of radiation upon marine organisms, the inorganic transfer of radioactive elements from seawater to the sediments, and the circulation and mixing processes which control the dispersion of introduced contaminants in coastal and estuarine environments and in the open ocean;
- (4) recommends that in order to coordinate the programs of the various agencies some method of interagency cooperation should be developed, possibly through an Oceanographic Research Board or Commission; and
- (5) recommends that cooperation between the United States and other nations in oceanographic research and exchange of data should be considered on a carefully supervised and reciprocal basis.

OYSTER INDUSTRY ASSISTANCE: H. R. 8060 (Glenn), a bill to authorize the Secretary of the Interior to make loans to certain producers of oysters, and for other purposes. Also identical bills H. R. 8064 (Johnson of Maryland), H. R. 8065 (Mc-Dowell), and H. R. 8079 (Downing); all to the Com-mittee on Merchant Marine and Fisheries; all introduced in House July 1. The bills authorize the Secretary of Interior to make loans to oyster producers in any area where excessive mortality of oysters has endangered the economic stability of the oyster industry, and caused a need for credit among producers, which is not readily available from private or public sources on reasonable terms. It provides for a rate of interest not to exceed 3 percent and on such general terms as the Secretary shall prescribe for any area. The bills also provide that the Secretary may acquire oyster brood stock, which possesses some resistance to causative agent of such mortality, and furnish the oyster producers in such area, resultant seed oysters for the propagation of new oysters, which will not be subject to such excessive mortality.

PACIFIC MARINE FISHERIES COMMISSION: The Chairman of the Pacific Marine Fisheries Commission transmitted to the Congress, pursuant to law, a report of that Commission for the year 1958 (with accompanying papers); presented in the House June 26, referred to the Committee on Merchant Marine and Fisheries; presented in the Senate June 29, referred to the Committee on Interstate and Foreign Commerce.

PRICE DISCRIMINATION ENFORCEMENT OF ORDERS: The House Committee on the Judiciary on June 25 ordered favorably reported S. 726, an act to amend section 11 of the Clayton Act to provide for the more expeditious enforcement of cease and desist orders issued thereunder, and for other purposes; with amendment (H. Rept. No. 580); referred to the Committee of the Whole House on the State of the Union.

House Report No. 580, Finality of Clayton Act Orders (June 26, 1959, 86th Congress, 1st Session, Report of the House Committee on the Judiciary together with individual comments to accompany S. 726), 22 pp., printed. The report presents the purpose of the bill as amended, reasons for the legislation, sectional analysis, and changes in existing law. The appendix contains recommendations of several Government departments and individual comments.

The House on July 6 passed S. 726, to provide for the more expeditious enforcement of cease-and-desist orders issued under the Clayton Act (amended). The legislation implements the enforcement procedures of the Clayton Act by making applicable the present Federal Trade Commission Act enforcement provisions against price discrimination, tying arrangements, mergers, and interlocking directorates.

Finality of Clayton Act Orders (Hearings, May 27 and 28, 1959, before the Antitrust Sub-committee No. 5 for use by the Committee on the Judiciary, United States House of Representatives, 86th Congress, 1st Session, on H. R. 432, H. R. 297, H. R. 6049, and S. 726, bills to amend section 11 of the Clayton Act to provide for the more expeditious enforcement of cease and desist orders issued thereunder, and for other purposes), 108 pp., printed. Contains text of the several legislative bills; testimony presented by Government and private industry representatives; certain Departmental, Commission, and Committee reports; and various statements submitted for the record. Also included is the document entitled, "The Merger Movement in Retail Food Distribution, 1955-58," a four-year study of the trend toward centralized power in America's major distributive industry, published by the National Association of Retail Grocers.

Senate on July 7 concurred in House amendments to S. 726, to amend section 11 of the Clayton Act so as to provide for the more expeditious enforcement of cease-and-desist orders issued thereunder, which action would have cleared the bill for the President. On July 8 the Senate reconsidered its action of July 7 in concurring in House amendments to S. 726, agreed to House amendments to the bill, with amendments, and returned the bill to the House. The legislation would implement the enforcement procedures of the Clayton Act by making applicable the present Federal Trade Commission Act enforcement provisions

against price discrimination, tying arrangements, mergers, and interlocking directorates.

PRICE DISCRIMINATION FUNCTIONAL DISCOUNTS: The Antitrust Subcommittee of the House Committee on the Judiciary conducted hearings June 25 and 26 on H. R. 848, H. R. 927, H. R. 2788, H. R. 2868, and H. R. 4530, to amend the Robinson-Patman Act so as to provide for the mandatory nature of functional discounts under certain circumstances, and for other purposes. The legislation is designed to supplement existing laws relating to price discrimination and for other purposes.

RAILWAY EXPRESS AGENCY ACTIVITIES: The desirability of the acquisition by the Post Office Department of equipment, facilities, and operations of the Railway Express Agency is under consideration. The Senate Post Office and Civil Service Commission announced hearings on the subject under S. Res. 8.

Senator Olin D. Johnston of South Carolina, Chairman of the Committee on June 18 sent the following telegram to the President of the Railway Express Agency:

"In compliance with your request hearing set for June 22nd under Senate Resolution 8 to consider advisability of the Post Office Department acquiring equipment and facilities of Railway Express Agency is being postponed to Tuesday, July 7th. Committee considers matter of great urgency. Cannot postpone beyond this date. Should railroads decide to discontinue Railway Express Agency, plans must be formulated to provide for adequate transportation of small packages by appropriate Government agency and to absorb employees of Railway Express Agency."

Senator Johnston also released the telegram received by him on June 12 from the President of the Railway Express Agency, requesting deferment of the hearings:

"Have advice of hearing set for June 22 under Senate Resolution 8 to consider advisability of having Post Office Department acquire equipment and facilities of Railway Express Agency. The Agency's management has laid a plan of reorganization before its Board of Directors. This will have intensive study of a special Board Committee prior to consideration at the next Board meeting on July 2. If approved, it will then be submitted to the 178 contract railroads for action. Accordingly, we urge that the June 22 hearing be deferred until after July 31. Please advise."

The Senator had previously announced on June 12 that the Committee would begin hearings on June 22.

SALMON IMPORT RESTRICTIONS: Joint Memorial of the State of California Legislative Assembly presented to the House June 16, and to the Senate June 17. The memorial urges the President and the Congress of the United States to take necessary actions to bring about a treaty between the United States, Canada, Japan, and Russia to properly protect the fish resources of the North Pacific Ocean; referred to the respective House and Senate Committees on Interstate and Foreign Commerce.

SHIP MORTGAGE INSURANCE AMENDMENTS OF 1959: The House Committee on Merchant Marine and Fisheries on June 30 ordered favorably reported S. 1434, an Act to amend Title XI of the Merchant Marine Act, 1936, as amended, with respect to insurance of ship mortgages, and for other purposes; without amendment (H. Rept. No. 631); referred to the Committee of the Whole House on the State of the Union. Provides that the prospective owner of a vessel be permitted to delay placing a mortgage on the vessel until some time after it has been delivered by the shipbuilder, without losing privilege of having the mortgage insured. Would permit the prospective owner to save on interest charges, and would reduce the period of time during which the Secretary of Commerce is under risk with respect to the mortgage.

House Report No. 631, an amendment to the Merchant Marine Act with respect to insurance of ship mortgages (July 1, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries, to accompany S. 1434), 8 pp., printed. Contains provisions of the bill, legislative background, reports favoring the legislation, and changes in existing law.

The Subcommittee on Merchant Marine of the House Committee on Merchant Marine and Fisheries on July 9 held hearings on H. R. 2241 and related bills, to amend title XI of the Merchant Marine Act, 1936, in order to provide mortgage and loan insurance for the construction, reconstruction, or reconditioning of vessels in shipyards in the continental United States.

SMALL BUSINESS AID FOR FIRMS AFFECTED BY FOREIGN TRADE POLICY: The Subcommittee on Small Business of the Senate Committee on Banking and Currency conducted hearings June 22, 29, 30, July 1, 2, 7, and 8, on pending small business legislation including S. 1609, to provide assistance to small business concerns adversely affected by foreign trade policy, and for other purposes.

SMALL BUSINESS INVESTMENT ACT OF 1958 AMENDMENTS: S. 2139 (Saltonstall), a bill to amend the Small Business Investment Act of 1958, and for other purposes; to the Committee on Banking and Currency; introduced in Senate June 9. The bill provides certain amendments for improving the small business investment program to meet the needs of small business for equity capital and long-term loans. Would provide banking subsidiaries of bank holding companies with greater latitude in investing in small business investment companies. Certain restrictions regarding the formation of investment companies would be eliminated as would restrictions which require equity capital be provided only through the medium of convertible debentures. The bill further eliminates the requirement that a small business concern must purchase a certain amount of a small business investment company's stock in order to obtain equity capital from the investment company. Included are a number of amendments and changes of clarifying nature, and for other purposes.

Also H. R. 7691 (Moore) introduced in House June 11, H. R. 7706 (McDowell) introduced in House June 12, H. R. 7751 (Bass of New Hampshire) introduced in House June 16, H. R. 8096 (Evins)

introduced in House July 6, and H. R. 8114 (Dwyer) introduced in House July 7; to the Committee on Banking and Currency. Similar to S. 979 and related bills previously introduced which provide certain amendments for improving the small business investment program to better meet the needs of small business, and for other purposes.

Subcommittee on Small Business of the Senate Committee on Banking and Currency conducted hearings on June 22, 29, 30, July 1, 2, 7, and 8, on small business legislation including S. 2139, to amend the Small Business Investment $\frac{1}{100}$ Act of 1958, and for other purposes.

SMALL BUSINESS TAX RELIEF: H. R. 7704 (McDowell), a bill to provide a program of tax adjustment for small business and for persons engaged in small business; introduced in House June 12; also H. R. 7651 (Lafore) introduced in House June 10, H. R. 7959 (Riehlman) introduced in House June 24, H. R. 8011 (Multer) introduced in House June 29, and H. R. 8090 (Alger) introduced in House July 6; all to the Committee on Ways and Means. Similar to H. R. 2 and related bills previously introduced which provide for tax adjustment in the interest of small business.

SOCIAL SECURITY TAX EXEMPTION PROVISIONS FOR CERTAIN FISHING ACTIVITIES:

S. 2126 (Eastland), a bill to exclude from coverage under the insurance system established by title II of the Social Security Act service performed by individuals in connection with certain fishing and related activities; to the Committee on Finance; introduced in Senate June 5. Also H. R. 8094 (Colmer); to the Committee on Ways and Means; introduced in House July 6.

STATE DEPARTMENT APPROPRIATIONS: The Subcommittee of the Senate Committee on appropriations on June 19, favorably reported to the full committee H. R. 7343, fiscal 1960 appropriations for the Departments of State and Justice, Judiciary, and related agencies. Included under the State Department are funds for the international fisheries commissions to enable the United States to meet its obligations in connection with participation in eight such commissions pursuant to treaties or conventions, and implementing Acts of Congress.

The Senate Committee on Appropriations on June 22 ordered favorably reported to the Senate H. R. 7343, with amendments (S. Rept. 424).

Senate Report No. 424, Departments of State and Justice, the Judiciary, and related agencies, appropriation bill 1960 (June 22, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Appropriations to accompany H. R. 7343), 20 pp., printed. Contains amount of bill as passed House, Committee recommendations, and comparison with amount of 1959 appropriations and 1960 budget estimates. For the international fisheries commissions, the Senate Committee recommended the same amount as provided by the House, \$1,725,000-an increase of \$61,300 over the 1959 fiscal year appropriations to meet increased pay costs, but \$29,000 below the amount of the budget request.

The Senate on June 23 passed with amendments \underline{H} , \underline{R} , $\underline{7343}$. The Senate insisted on its amendments,

asked for conference with the House, and appointed conferees.

The House disagreed to Senate Amendments to \underline{H} . \underline{R} . $\underline{7343}$, on June 29 agreed to a conference with the Senate, and appointed conferees.

The Senate and House Conferees, on July 30 filed a conference report on H. R. 7343, making appropriations for the Departments of State and Justice, the Judiciary, and related agencies for fiscal year 1960 (H. Rept. 620).

House Report No. 620, Departments of State and Justice, the Judiciary, and related agencies appropriation bill, 1960 (June 30, 1959, 86th Congress. 1st Session, Conference Report of the Joint Senate and House Committee of Conferees, to accompany H. R. 7343), 7 pp., printed. Lists the recommendations made by the Conference Committee to the respective Houses on the disagreeing votes on the amendments of the Senate to the bill. The report also contains an explanation of the effect of actions agreed upon and recommended by the Committee. For the International Fisheries Commissions the Committee recommended the same amount as provided by both the House and Senate -- \$1,725,000, an increase of \$61,300 over the 1959 fiscal year appropriation to meet increased pay costs, but \$29,000 below the amount requested in the budget estimate.

House agreed to conference report on July 1 and receded and concurred on certain Senate amendments. The Senate on the same date agreed to conference report concurring to certain House amendments to Senate amendments clearing H. R. 7343 for the President.

SUPPLEMENTAL APPROPRIATIONS, 1960: H. R. 7978 (Thomas), a bill making supplemental appropriations for the fiscal year ending June 30, 1960, and for other purposes; to the Committee of the Whole House on the State of the Union; introduced in House June 26.

House Report No. 579, Supplemental Appropriation Bill 1960 (June 26, 1959, 86th Congress, 1st Session, Report of the House Committee on Appropriations, to accompany H. R. 7978), 13 pp., printed. Provides supplemental appropriations for certain agencies and departments. Includes \$10.5 million for the State of Alaska as limited assistance during the transitional period from territorial status to help finance functions formerly performed by the Federal Government; \$850,000 for studies to be carried out in fiscal year 1959-1960 by the National Outdoor Recreation Review Commission in conducting its nation-wide inventory and evaluation of outdoor recreation assets; \$660,000 for the River Basin Study Commission for South Carolina-Georgia-Alabama-Florida; and \$720,000 for the River Basin Study Commission for Texas.

Supplemental Appropriation, 1960: Hearings before the Subcommittee on Deficiencies, House Committee on Appropriations, 86th Congress, 1st Session, on Supplemental Appropriation Bill, 1960 (providing funds for certain agencies, commissions, departments, and other purposes), 317 pp., printed. Contains budget estimates and testimony presented by agencies and departments of Government. Included are funds pursuant to legislative authorization for transitional grants to Alaska; for

the National Outdoor Recreation Resources Review Commission; and for certain River Basin Study Commissions.

House on June 29 passed H. R. 7978, making supplemental appropriations for fiscal year 1960 for certain departments and agencies of Government; referred to the Senate Committee on Appropriations.

The Senate Committee on Appropriations held hearings July 13, 14, 16 and 17 on H. R. 7978, supplemental appropriations for fiscal 1960. Included are funds pursuant to legislative authorization for transitional grants to Alaska (Public Law 86-70); for the National Outdoor Recreation Resources Review Commission; and for certain River Basin Study Commissions.

TRADE AGREEMENTS PROGRAM: The President on June 25, pursuant to law, transmitted to the Senate the third annual report on the operation of the trade agreements program, with accompanying message (S. Doc. No. 31); referred to the Committee on Finance.

TRADE AGREEMENT ACT AMENDMENTS:
H. R. 7863 (Dent), a bill to provide that the authority to enter into foreign trade agreements shall expire on June 30, 1960, and to provide that the Congress may disapprove any foreign trade agreement proposed to be entered into during the 1-year period beginning on July 1, 1959; to the Committee on Ways and Means; introduced in House June 19. Somewhat similar to H. R. 670 and related bills previously introduced which would provide for changes in the Trade Agreements Act, and for other purposes.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: H. J. Res. 423 (Oliver), a House Joint Resolution to provide for a special research inquiry into the causes of chronic unemployment in economically depressed areas, and for other purposes; introduced in House June 10; also H. J. Res. 434 (Anderson of Montana) introduced in House June 23; both to the Committee on Government Operations. Provides authority for the Council of Economic Advisers to the President to conduct an official study or investigation to determine what remedial measures might be undertaken to counteract the growth of chronic unemployment resulting from technological advance in industry, and for other purposes. Similar to H. J. Res. 411 previously introduced.

UNEMPLOYMENT TAX EXEMPTION PROVISIONS FOR CERTAIN FISHING ACTIVITIES: H. R. 8095 (Colmer), a bill to provide that the tax imposed by the Federal Unemployment Tax shall not apply with respect to service performed by individuals in connection with certain fishing and related activities; to the Committee on Ways and Means; introduced in House July 6. Similar to S. 2125 previously introduced.

WAGES: The Secretary of Labor transmitted to the Congress a draft of proposed legislation to amend the Fair Labor Standards Act of 1938, as amended, to provide more effective procedures for enforcing the provisions of the act (with accompanying papers); presented in the House July 1, referred to the Committee on Education and Labor; presented in the Senate July 7, referred to the Committee on Labor and Public Welfare.

The Subcommittee on Labor of the Senate Committee on Labor and Public Welfare met in executive session July 9 on S. 1046 and other bills to amend the Fair Labor Standards Act, so as to extend coverage under the Act, increase the minimum hourly wages, and for other purposes.

WAGE LAW ENFORCEMENT OF CERTAIN PROVISIONS: H. R. 8059 (Frelinghuysen), a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide more effective procedures for enforcing the provisions of the Act; introduced

in House July 1; referred to the Committee on Education and Labor. Provides for amendment of existing law to strengthen enforcement provisions in regards to payment of minimum wages and overtime compensation.

WATER CONSERVATION ACT OF 1959: The House committee on Public Works on July 9-10 conducted hearings on H. R. 8, to promote and establish policy and procedure for the development of water resources of lakes, rivers, and streams.



DIVERS REPORT REEFS ATTRACT NEW FISH LIFE

Artificial ocean reefs are beginning to accomplish just what was expected of them. They were established in an effort to attract marine life to former underwater barren areas, thus providing additional sport to anglers.

At Paradise Cove, where old car bodies were placed on the bottom, 18 species of fish were counted during checkup dives by California biologists. Most common were kelp bass, sargo, and several kinds of perch, including rubberlip, pile, black, barred, shiner, walleye, and rainbow. There now are a fair number of sheepshead and one cabezon was seen for the first time.

At Redondo Beach-Palos Verdes, where junked streetcars were placed, 11 species of fish were observed, most of them inside the cars. They were: kelp and sand bass, halfmoon, blacksmith, two kinds of blenny, sand dab, sheepshead, angel shark, and an unidentified flatfish.

Loitering near by was a school of bonito and three lobsters apparently were trying to decide whether to settle down in the new "housing tract."

At Monterey Oil Island-Seal Beach, large numbers of fish--24 species in all--were counted. Oil crews reported excellent fishing.

A dive was made off Corona del Mar to check the need for a possible future reef. However, because there were many rocks on the sand bottom and the area appeared to be naturally good habitat, no artificial development seems necessary.

At the Richfield Oil Island-Rincon, lingcod and sand bass were noted for the first time and larger numbers of large rubberlip perch were seen than on previous dives.

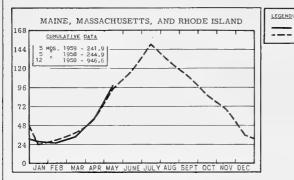
The Standard-Humble Oil Platform-Summerland area had lingcod, cabezon, and three species of rockfish for the first time. Jack mackerel were numerous.

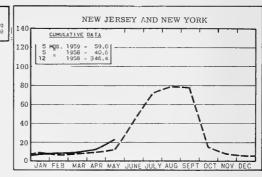
The Carlisle report said commercial fishing and cannery interests as well as sportsmen have shown considerable interest in the project and have pledged their support. (Outdoor California, January 1959.)

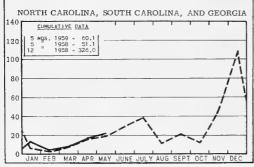


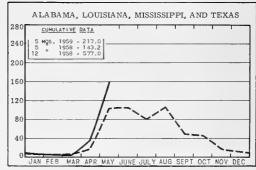
CHART I - FISHERY LANDINGS for SELECTED STATES

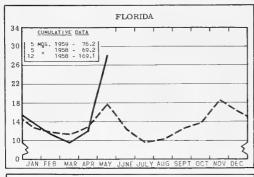
In Millions of Pounds

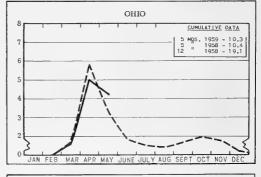


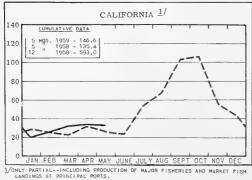












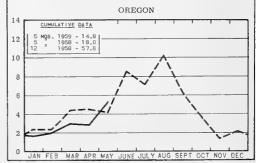
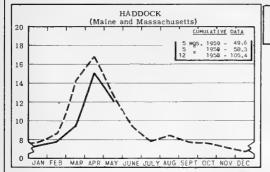
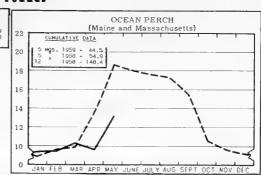


CHART 2 - LANDINGS for SELECTED FISHERIES

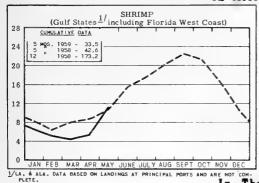
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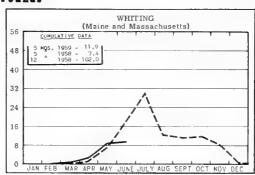
LEGEND:



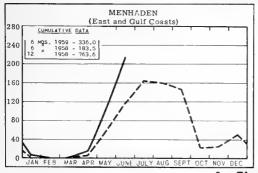


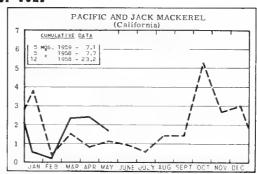
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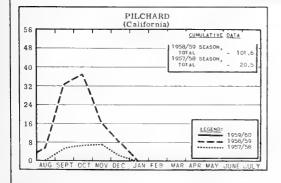


PLETE. In Thousands of Tons





In Thousands of Tons



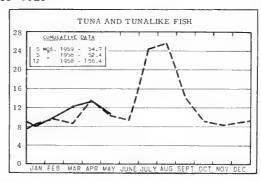
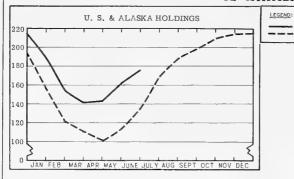
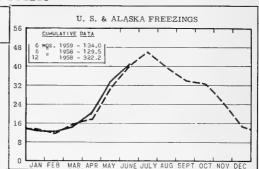
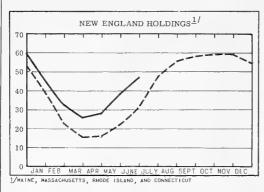


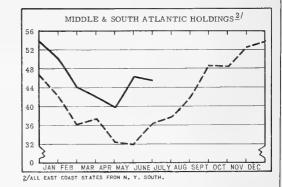
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

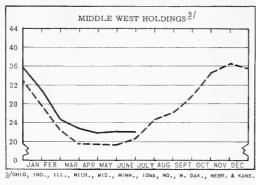
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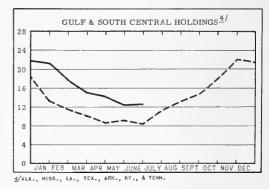


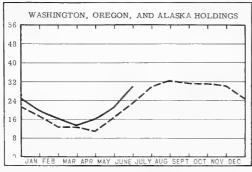


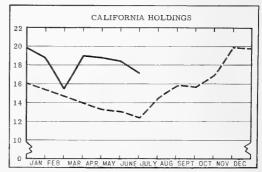




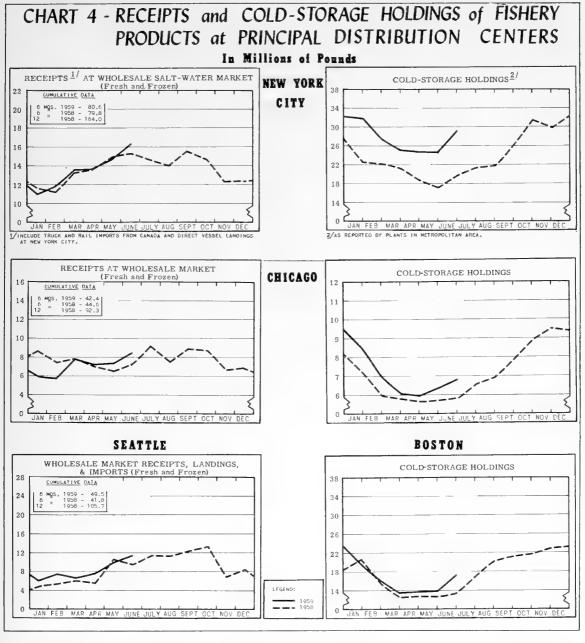








* Excludes salted, cured, and smoked products.



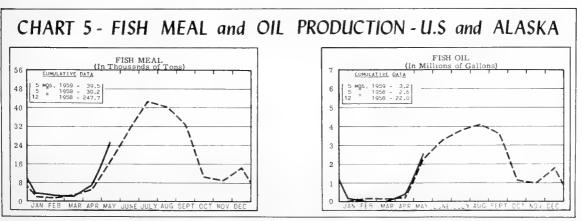
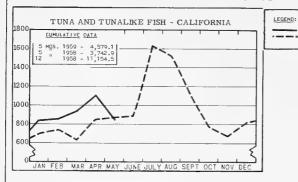
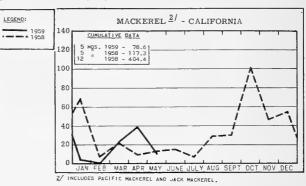
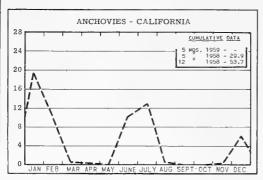


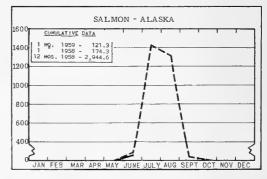
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



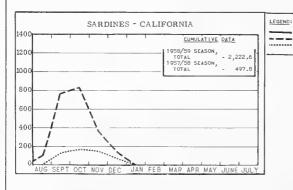






	SARDINES 1/(Estimated) ~ MAINE
800	CUMULATIVE DATA
700	
600	
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STANDARD CASES					
No. Cans	Designation	Net Wgt.			
100	1 drawn	$3\frac{3}{4}$ oz.			
48		5 oz.			
48	# ½ tuna	6 & 7 oz.			
48	# 1 oval	15 oz.			
48	I-lb. tall	16 oz.			
48	1/2-lb.	8 oz.			
	100 48 48 48	100 ¼ drawn 48 48 #½ tuna 48 # 1 oval 48 1-lb. tall			



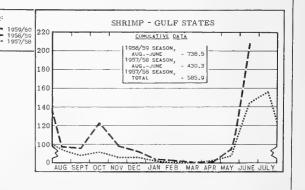
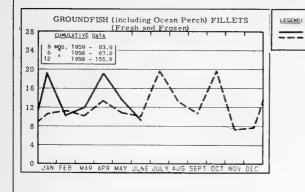
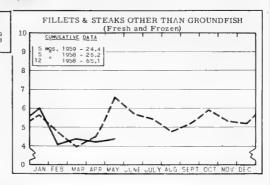
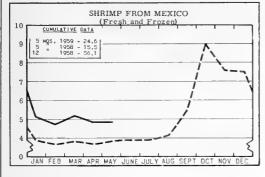


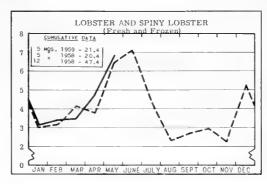
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

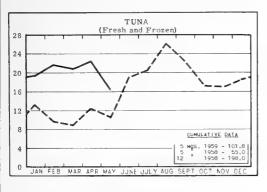
In Millions of Pounds

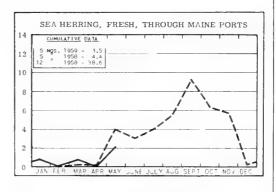


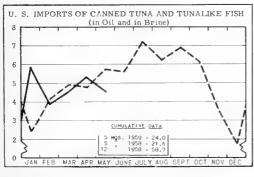


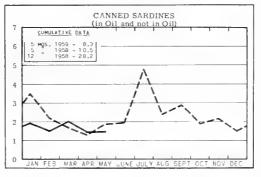














FISH AND WILDLIFE SERVICE

PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES

AND ALASKA.
- FISHERY LEAFLETS.

SSR. - FISH, -SPECIAL SCIENTIFIC REPORTS -- FISHERIES (LIMITED DISTRIBUTION).
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRO-DUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

Number Title

CFS-1990 - Ohio Landings, March 1959, 2 pp.

CFS-1994 - Fish Meal and Oil, 1958 Annual Summary, 4 pp.

CFS-2000 - New York Landings, 1958 Annual

Summary, 8 pp.

CFS-2001 - Florida Landings, 1958 Annual Summary, 10 pp.

CFS-2035 - California Landings, December 1958, 4 pp.

CFS-2036 - North Carolina Landings, March 1959, 3 pp.

CFS-2037 - Georgia Landings, March 1959, 2 pp.

CFS-2038 - Texas Landings, February 1959, 3 pp. CFS-2042 - Rhode Island Landings, 1958 Annual

Summary, 7 pp.

CFS-2045 - Maine Landings, March 1959, 3 pp.

CFS-2046 - Shrimp Landings, December 1958, 6 pp.

CFS-2047 - South Carolina Landings, March 1959, 2 pp.

CFS-2049 - Frozen Fish Report, April 1959, 8 pp. CFS-2057 - Fish Meal and Oil, March 1959, 2 pp.

CFS-2058 - Fish Sticks and Portions, January-March 1959, 3 pp.

FL-476g - Canned Fish Retail Prices, April 1959, 27 pp.

FL-480 - The Bait Shrimp Industry of the Gulf of Mexico, by Anthony Inglis and Edward Chin, 15 pp., illus., revision of FL-337, April 1959. Live shrimp is the preferred bait for sea trout, redfish, flounders, and most game fishes of the bays and inshore waters of the Gulf of Mexico. The use of shrimp for this purpose has given rise to a large bait industry in some areas. This study describes the kinds of shrimp in the bait fishery and the general life history of the white shrimp. In discussing the bait shrimp industry of Galveston area, Texas, and Florida, the fishing gear and methods of operation, transporting and holding methods, and trade practices are covered. This report also includes suggestions

for holding live bait shrimp, scientific names of species mentioned in the text and publications on the biology of shrimp and the bait shrimp industry.

FL-483 - Instructions for Typing Manuscripts to be Printed at the Government Printing Office (With Exceptions for Manuscripts to be Processed), 7 pp., March 1959.

FL-485 - Japanese Fisheries Based in Overseas Areas, 30 pp., illus., May 1959. Describes the expansion of the Japanese high-seas fisheries since the end of the Occupation in 1952. Sections are included on development and types of overseas fisheries, Government control of overseas operation, and overseas operations by countries. Japanese overseas enterprises are now in operation or planned in more than 35 countries, in which about 200 fishing vessels are based. About 140 of these are tuna vessels, mainly long-liners. Tuna processing plants are in some stage of development in 15 countries. Other plants include sardine canneries, shrimp and crab canneries and freezing plants, fish meal plants, and freezers for locally-consumed fish.

FL-486 - Recommended Treatment for Fish Parasite Diseases, by Glenn L. Hoffman, 4 pp., April 1959.

Conservation Notes--Fishing for Food, Circular 55, 6 pp., illus., processed, March 1959. This pamphlet describes some fishing terms; the need for conservation of the seas' fish resources; and the dangers of predators, obstructions, water fluctuations, storms, human activity, domestic and industrial pollution, and careless use of pesticides. It also describes the work of the Bureau of Commercial Fisheries and other fact-finding organizations; the work of fishery biologists in studying the life history of various species; the problems of fish habitats; plankton; tagging; color marking; underwater television and SCUBA divers; chemical aids; electrical aids; spawning; sounds made by fish; sea mammals; the American catch; and vessels and gear.

SSR-Fish. No. 261 - Plastic Standpipe for Sampling Streambed Environment of Salmon Spawn, by Harold A. Gangmark and Richard G. Bakkala, 24 pp., illus., November 1958.

SSR-Fish. No. 281 - Water Soluble Vitamin Requirements of Silver Salmon, by John A. Coates and John E. Halver, 12 pp., illus., November 1958.

- SSR-Fish. No. 288 Intermediary Metabolism of Fishes and Other Aquatic Animals, by M. Gumbmann, W. Duane Brown, and A. L. Tappel, 55 pp., illus., December 1958.
- SSR-Fish. No. 296 Etiology of Sockeye Salmon "Virus" Disease, by Raymond W. Guenther, S. W. Watson, and R. R. Rucker, with Addendum by A. J. Ross and R. R. Rucker, 14 pp., illus., February 1959.

Firms Canning 1958 (Revised): SL-101 - Salmon.

SL-102 - Maine Sardines.

SL-104 - Mackerel.

SL-111 - Clam Products.

SL-112 - Shrimp.

- SL-151 Firms Manufacturing Fish Meal, Scrap, and Body Oils, 1958 (Revised).
- Sep. No. 553 Shrimp Exploration in Central Alaskan Waters by M/V John N. Cobb, July-August 1958.
- Sep. No. 554 Current Status of the Inter-American Development Bank.
- Sep. No. 555 Research in Service Laboratories (July 1959): Contains these articles -- "Proximate Composition of Gulf of Mexico Industrial Fish Part 3 - Fall Studies (1958);" and "Technical Note No. 54 - Dicarbonyl Compounds as Components of Fish Odor.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

- California Fishery Products Monthly Summary, April 1959, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.
- (Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, April 1959, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.
- Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1959, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

- New England Fisheries--Monthly Summary, April 1959, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; coldstorage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.
- New York City's Wholesale Fishery Trade -- Monthly Summary for January 1959, 21 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.
- (Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1959, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.
- Fishery Regulation and the Position of Coastal Countries, by Kenzo Kawakami, Pacific Salmon Investigations, Translation Series No. 22, 22 pp., processed. (Translated from Suisan Kagaku, vol. 6, no. 3-4, December 1957, pp. 13-20.) U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Pacific Salmon Investigations, Seattle, Wash., July 30, 1958.
- Provisional Keys to the Fishes of Alaska, by Norman J. Wilimovsky, 120 pp., printed. Fisheries Research Laboratory, U. S. Fish and Wildlife Service, P. O. Box 2021, Juneau, Alaska, May 1958.
- Studies on Fish Culture in the Aquarium of Closed-Circulating System, Its Fundamental Theory and Standard Plan, by Aritsune Saeki, 14 pp. processed, 6 pp. printed tables, English translation. (From Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 11, 1958, pp. 684-695.) U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Box 3830, Honolulu,
- Translated Data on the Japanese Tuna Fishery, by Wilvan G. Van Campen, 11 pp., illus., processed. (Statistical tables on the Japanese tuna fishing industry which appeared in the February 1956 issue of Katsuo to Maguro, organ of the Japan Tuna Boat Owners' Association.) Pacific Oceanic Fishery Investigations, U. S. Fish and

Wildlife Service, Box 3830, Honolulu, Hawaii, May 7, 1956.

Young Tunas Found in Stomach Contents, by Hiroshi Yabe, Shoji Ueyanagi, Shoji Kikawa, and Hisaya Watanabe, 30 pp., illus., processed. (Translated from Report of the Nankai Regional Fisheries Research Laboratory, no. 8, March 1958, pp. 31-48 and 3 pages of plates.) U.S. Bureau of Commercial Fisheries, Hawaii Area Office, Box 3830, Honolulu, Hawaii, 1958.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASH-INGTON 25, D. C.

Decline of the Yellowtail Flounder (LIMANDA FERRUGINEA) Off New England, by William F. Royce, Raymond J. Buller, and Ernest D. Premetz, Fishery Bulletin 146 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 169-267, illus., printed, 55 cents, 1959. The yellowtail flounder fishery off New England, which had risen to a place of importance with the increased food demands during World War II, was studied intensively from 1942 to 1949 to determine if changes in the yellowtail population were related to fishing pressure and whether regulation of the fishery was necessary to conserve the species. Tagging and other evidence indicated the existence of 5 stocks, the most important of which to United States fishermen occurred off southern New England. The landings from this stock declined from 63 million pounds in 1942 to 10 million pounds in 1949, but the population did not exhibit the usual symptoms of heavy fishing; a declining average size, an increasing proportion of young fish, or an increasing growth rate. Estimates of mortality and recruitment indicated that the fishery was drawing gradually on a reserve which for unknown reasons was not replenished by young. There is no clear evidence that greater total production could have been achieved by protecting fish at any size, in an area, or at any time of the year.

Grayling of Grebe Lake, Yellowstone National Park,
Wyoming, by Thomas E. Kruse, Fishery Bulletin
149 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 307-351, illus., printed, 35 cents, 1959.

Laws and Regulations for Protection of the Commercial Fisheries of Alaska, 1959, Regulatory Announcement 60, 33 pp. with 3-p. addendum, printed, March 1959, 25 cents. This publication is divided into two sections. One section contains laws for the protection of the commercial fisheries of Alaska and related information, including the authority for regulation, rules regarding oyster culture, Bristol Bay residence requirements, regulation of salmon escapement, fishing-gear restrictions, exceptions to weekly closed seasons, etc. The second section contains all the regulations governing the commercial fisheries in Alaska. These 1959 regulations supersede the regulations published in Regulatory Announcement 56 which became effective March 30, 1958. They have been revised, and as a result they contain many changes as well as the usual seasonal changes for 1959. The addendum, a reprint from the Federal Register of April 28, 1959, contains regulations for the restriction of salmon fishing in Bristol Bay.

Sexual Maturity and Spawning of Albacore in the Pacific Ocean, by Tamio Otsu and Richard N. Uchida, Fishery Bulletin 148 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 287-305, illus., printed, 20 cents, 1959.

Some Uses of Statistical Analysis in Classifying
Races of American Shad (ALOSA SAPIDISSIMA),
by Donald R. Hill, Fishery Bulletin 147 (from
Fishery Bulletin of the Fish and Wildlife Service,
vol. 59), pp. 269-286, illus., printed, 20 cents,
1959.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ANGOLA:

Estudos de Biologia Maritima (Marine Biological Studies), Anais, vol. XII, tomo II, 1957, 157 pp., illus., printed in Portuguese. Junta das Missoes Geograficas e de Investigacoes do Ultramar, Rua da Junqueira, 86, Lisbon, Portugal. Describes the work of the Marine Biological Mission from Portugal to Angola.

ANIMAL FEEDING:

"The Use of Amino Acid Values in Formulation of Feeds," by H. S. Wilgus, article, Feedstuffs, vol. 30, December 20, 1958, p. 26, printed. Feedstuffs, Miller Publishing Co., 118 S. 6th St., Minneapolis 2, Minn.

ANTIBIOTICS:

"Antibiotic Now OK for Fish," article, Food Engineering, vol. 31, no. 5, May 1959, p. 41, illus., printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. For more than 3 years antibiotics have been used as a dipfor fish fillets in Canada. The U. S. Food and Drug Administration recently approved a petition by a chemical company for use of chlortetracycline at 5 parts per million on fresh fish, shucked scallops, and unpeeled shrimp. The approved process involves use of a dip or ice containing a solution of the antibiotic by commercial fishermen on freshcaught, whole, headed, and gutted fish.

AUSTRALIA:

The Barramundi LATES CALCARIFER (Bloch) in Queensland Waters, by D. J. Dunstan, Technical Paper No. 5, 22 pp., illus., printed. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, 1959.

Measurements of Light Penetration in the Tasman Sea, 1955-57, by H. R. Jitts, Technical Paper No. 6, 26 pp., illus., printed. Division of Fisheries and Oceanography, Commonwealth

Scientific and Industrial Research Organization, Melbourne, Australia, 1959.

Statistical Bulletin: Fishing and Whaling, Australia, no. 4, 1957-58, 18 pp., illus., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the fourth of a series of annual bulletins dealing with the fishing and whaling industries in Australia. The statistics, covering quantity and value of catch and related data, pertain to the year 1957/58 for fisheries and the 1958 season for whaling, with comparative data for the previous 4 years. The bulletin is divided into two parts—the first dealing with fisheries and the second with whaling. The part on fisheries is subdivided into a section on edible fishery products—finfish, crustaceans, and molluscs; and another on pearl and trochus shells.

BROOK TROUT:

The Eastern Brook Trout; Its Life History, Ecology, and Management, by John Brasch, James McFadden, and Stanley Kmiotek, Publication 226, 10 pp., illus., printed. Wisconsin Conservation Dept., Madison, Wis., 1958.

BYPRODUCTS:

"Fish Meal and Oil. 4--The Rate of Oxidation of Fat in Pilchard Presscake," by G. M. Dreosti and G. H. Stander, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, pp. 18-20, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa,

CALIFORNIA:

The Sea Bottom off Santa Barbara, California:

Biomass and Community Structure, by J. Laurens Barnard and Olga Hartman, 16 pp., illus., printed. (Reprinted from Pacific Naturalist, vol. 1, no. 6, June 1, 1959.) Beaudette Foundation for Biological Research, Box 482, R. F. D. 1, Solvang, Calif.

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products, 1958, Circular No. 33, 16 pp., Illus., printed. Department of Fish and Game, Biostatistical Section, Marine Resources Operations, Sacramento, Calif., 1959.

CANADA:

Eleventh Annual Report of the Pacific Marine

Fisheries Commission for the Year 1958, 29
pp., printed. Pacific Marine Fisheries Commission, 340 State Office Building, 1400 S. W.

Fifth Ave., Portland, Ore. Reports briefly the specific activities of the Pacific Marine Fisheries Commission during 1958 and presents a review of long-term developments in the fields of research, regulation, and coordination. Describes recent international developments affecting jurisdiction over fisheries. Presents sections on otter-trawl, California albacore, Pacific Coast shrimp, and offshore troll salmon fisheries.

Fisheries Statistics of Canada, 1957 (Prince Edward Island), 30 pp., illus., printed in French

and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, May 1959. Contains tables giving the quantity and value of fishery products landed in Prince Edward Island in 1939-1957, by species; quantity and value by species and fisheries districts; quantity and value of manufactured fishery products by species, 1956-57; capital equipment in the primary fisheries operations; and the number of fishermen engaged in the primary fisheries operations.

Results of Special Sport Fishing Surveys, 1957-1958 (Supplementary Report to the 1958 Annual Report to the 1958 Annual Report of Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia), 23 pp., illus., processed. Department of Fisheries, 1110 West Georgia St., Vancouver 5, B. C., Canada, May 15, 1959.

CHILE:

Cooperativas Pesqueras (Fishery Cooperatives),
Boletin Nos. 1 and 2, January and February
1959, respectively, 4 pp. ea., illus., processed
in Spanish. La Seccion Cooperativas, Depto.
Fomento de Pesca y Caza, Valparaiso, Chile.
The first two issues of a new monthly bulletin
presenting news on fishery cooperatives sponsored by the Chilean Department of Fish and
Wildlife. Covers the activities and benefits of
the fishery cooperatives of Chile.

CLAMS:

The Bay Clams of Oregon (Their Identification, Relative Abundance, and General Distribution), by Lowell D. Marriage, Educational Bulletin No. 2, 28 pp., illus., printed. Fish Commission of Oregon, Portland, Ore., 1958. Presents a description of the various species of Oregon's bay clams, a guide to the general abundance and distribution of the major species, and description of the various bays where the clams are produced. Statistical data are also included showing Oregon's commercial clam production during 1928-56.

COD:

"Chemical Indices of Decomposition in Cod," by Fred Hillig, L. R. Shelton, Jr., J. H. Loughrey, and Jerome Eisner, article, Journal of the Association of Official Agricultural Chemists, vol. 41, November 1958, pp. 763-776, printed. Association of Official Agricultural Chemists, Inc., Box 540, Benjamin Franklin Station, Washington 4, D. C.

COMMON MARKET:

"Le Marché Commun, Vu par les Américains" (The Common Market, the American Point of View), article, France Pêche, vol. 40, no. 29, May 1959, pp. 15-16, printed in French. France Pêche, 84, Rue Carnot, Lorient, France.

CONTAINERS:

"Containers for Transporting Fresh Fish in Ice," by R. J. Nachenius, article, Annual Report, Fishing Industry Research Institute, 1957, vol. 11, p. 14, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1958.

CROAKER:

Migration of the Croaker, MICROPOGON UNDULATUS, by Dexter S. Haven, No. 82, 6 pp., illus., printed. (Reprinted from Copeia, no. 1, April 17, 1959, pp. 25-30.) Virginia Fisheries Laboratory, Gloucester Point, Va.

CUBA

Catalogo de Peces Cubanos (Catalogue of Cuban Fish), by Pedro Pablo Duarte-Bello, Monografia 6, March 1959, 204 pp., printed in Spanish with common names in English, \$3.00. Universidad Catolica de Santo Tomas de Villanueva, Laboratorio de Biologia Marina, Apartado No. 6, Marianao, Cuba.

DELAWARE:

Marine Laboratories (Newark and Lewes, Delaware), Biennial Report, 1957-1958, no. 4, 16 pp., illus., printed. University of Delaware, Department of Biological Sciences, Newark, Del., 1959.

FISH MEAL:

"Determination of Fat in Fish Meal by Refractometry," by H. Treiber, article, Fette, Seifen, Anstrichmittel, vol. 60, 1958, pp. 488-490, printed. Deutsche Gesellschaft für Fettwissenschaft, Industrieverlag von Herhaussen K. G., 24 Rodingsmarkt, Hamburg 11, Germany.

"Fish Meal. Investigation of Fat Content," by A. F. M. G. Luijpen, D. Hooghiemstra-Brasser, and A. C. Hindriks, article, Fette, Seifen, Anstrichmittel, vol. 60, 1958, p. 951, printed.

Deutsche Gesellschaft fur Fettwissenschaft, Industrieverlag von Herhaussen K. G., 24 Rodingsmarkt, Hamburg 11, Germany.

FISH OILS:

"The Role of Free Fatty Acids on Antioxidant Effectiveness in Unsaturated Oils," by Harold S. Olcott, article, Journal of the American Oil Chemists' Society, vol. 35, November 1958, pp. 597-599, printed. American Oil Chemists Society, 35 E. Wacker Drive, Chicago 1, Ill.

FISH SOLUBLES:

"A Comparison of the Nutritive Value of Condensed Herring Solubles Prepared by Acid and Enzyme Treatments," by B. E. March, Jacob Biely, J. McBride, R. A. MacLeod, and D. R. Idler, article, Progress Reports of the Pacific Coast Stations, no. 111, August 1958, pp. 23-28, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

FISHERIES DEVELOPMENT:

Principles of Fisheries Development, by Casper Josephus Bottemann, 689 pp., illus., printed, \$12. North-Holland Publishing Co., P. O. Box 103, Amsterdam, Netherlands, 1959. The aim of this textbook (in five parts) is to trace the principles which determine the structure of fisheries and to establish, on this basis, the principles governing fisheries development; as well as to find how the industry might contribute more fully to the world's food supply. Part 1 deals with the basic facts concerning fish populations.

Part 2 covers the principles of fishing methods and units and use of resource. Part 3 on the main features of dynamic fisheries describes expansions in fisheries proper, role of complementary industries, and structural problems of fisheries. Part 4 dealing with the general principles of development discusses pattern of structure, development and leverage, climates for development, and development strategy. Part 5 on problems of development in fisheries discusses conditioning factors in development, basic leverage patterns, development of fishing units, methods and instrument of leverage, and strategy of leverage. The author points out that the book is confined to sea fisheries because those produce the most intricate problems. All phases of fisheries are covered, from the resource in the sea to the final product and its marketing. The book is a general philosophy on fisheries. A scholarly work of compelling interest for all those wishing to increase their knowledge of fishery science.

FOOD AND AGRICULTURE ORGANIZATION:

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Informe al Gobierno de Mexico sobre el Consumo y la Distribucion del Pescado en los Mercados (Report to the Government of Mexico on the Consumption and Distribution of Fish in the Markets), by John Fridthjof, FAO Report No. 694, 27 pp., processed in Spanish, May 1958. Reports on fish production in Mexico, dry fish and its cheap disposal, problems of distribution, necessity for special instruction to the consumer, national and local inquiries, fish work unit, application of the activities of the fish work unit, the idea of a puppet show, other activities of the adult education program, the program on a local level in the Federal District, States of Morelos, Michoacan, and Veracruz, and an evaluation of reported activities.

Report to the Government of Turkey on Fishery
Biology, by Hermann Einarsson, FAO Report
No. 829, 80 pp., illus., processed, May 1958.
Discusses the background and research facilities; technical work accomplished-field work at sea and work in the laboratory; and conclusions regarding research services.

Informe al Gobierno de Mexico sobre Consumo y Distribucion del Pescado en los Mercados (Report to the Government of Mexico on Consumption and Distribution of Fish in the Markets), by John Fridthjof, FAO Report No. 843, 23 pp., illus., processed in Spanish, July 1958. Reports on a follow-up study to supplement FAO Report No. 694.

Rapport au Gouvernement de la Tunisie sur la Situation de la Flotte Chalutiere Tunisienne (Report to the Government of Tunisia on the Situation of the Tunisian Trawler Fleet), by Peter Gurtner, FAO Report No. 864, 45 pp., illus., processed in French, July 1958. Describes the survey and evaluation by a swiss naval architect of the Tunisian trawler fleet. Discusses the vessels, motors, and gear of the fleet, method of fishing applied, personnel, the point of view of independent owners, facilities of the shipyards, and recommendations for long- and short-term programs.

Report to the Government of Saudi Arabia on Exploration and Commercial Fishing Operations in the Red Sea, by Gonzalo G. Ferrer, FAO Report No. 877, 30 pp., illus., processed, May 1958. Reports on the work done in 1954-56 along the Arabian Coast of the Red Sea. Discusses initial and later surveys of the fishing grounds, commercial fishing operations, the gear, and fishing methods used.

Report to the Government of Sudan on the Red Sea Fisheries (based on the work of Erling Oswald), FAO Report No. 934, 29 pp., illus., processed, August 1958. Describes the work accomplished in operations out of Port Sudan with a motor boat fitted for multiple trolling and the demonstrations to local fishermen of greatly increased earnings with modern fishing gear. Subsequently, a Red Sea Fishermen's Cooperative Society was formed.

Annotated Bibliography on Fishing Gear and Methods, Indo-Pacific Fisheries Council Special Publications No. 4, 85 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1958. Out of 3,000 bibliographic references on fishing gear, 672 titles have been selected and are presented with brief annotations giving an indication of the information contained in each publication or article. Also contains a list of the full names of the periodicals in which the references were published and the addresses of their publishers, including only those which are not already listed in the Handbook for World Fisheries Abstracts. The material appears on one side only of each page; the paper being of a heavy, stiff quality, making the bibliographies suitable for cutting out and inclusion in a card index.

Report of the F. A. O. Training Centre in Fishery Co-Operatives and Administration, vol. I, 46 pp., printed; vol. II (Fishermen's Co-Operatives in the Indo-Pacific Region), by Edward Szczepanik, 128 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1958. (For sale by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.) Describes in two volumes the work accomplished at the FAO Indo-Pacific Training Centre in Fishery Co-Operatives and Administration, held in Sydney, Australia, December 16, 1957, to January 25, 1958. The first volume presents a factual account of the organ-

ization, conduct, and training program of the Centre. Its primary purpose is to inform Governments concerning the work accomplished at the Centre. It also provides guidance as to the value of this type of regional project and the practical measures required in the preparation and execution of such a program of training. Some observations are offered on the advantages, from the standpoint of the participants, of certain training activities, especially practical work and discussions and on the importance of achieving group cohesion while allowing full opportunity for the study of the problems of individual participants.

The second volume consists of a review of fishermen's cooperatives in the Indo-Pacific region, based on reports and other documents prepared and assembled in connection with the Centre, and includes an analytical study of the role of cooperatives in relation to middlemen problems in the region generally. The main feature presented in this study is the remarkable postwar growth of the cooperative movement in the Indo-Pacific fisheries. This is the first comprehensive account of the cooperative movement in the Indo-Pacific fisheries as a whole and therefore presents the first opportunity for regionwide comparisons which can be most valuable in assessing the results and planning the future of the movement in particular countries. It also enables the reader to appreciate the past development, current problems, and future prospects of this important feature of the Indo-Pacific fisheries.

FRANCE:

Federation Nationale des Syndicats Francais de Conserveurs des Produits de la Mer (National Federation of French Syndicates of Canners of Marine Products), 8 pp., illus., printed in French. Federation Nationale des Syndicats Francais de Conserveurs des Produits de la Mer, Paris, France, 1959. Presents statistical tables on French production of canned fishery products during 1958.

"Le Pays et la Pêche Face au Marche Commun" (The Country and the Fishing Industry in the Face of the Common Market), by Jules Molard, article, France Pêche, vol. 4, no. 28, April 1959, pp 15-17, printed in French. France Peche, 84, Rue Carnot, Lorient, France. Discusses the objectives to be achieved in the fishing industry so that full advantage may be taken of the latest financial adjustments. Cites examples of equipment schemes which are not merely projects but which, on the contrary, have proven their efficiency when applied to operational units of diverse types.

"La Pêche a la Lumière en Méditerranée" (Fishing With Lights in the Mediterranean), by Robert Lenier, article, France Pêche, vol. 4, no. 28, April 1959, pp. 44-47, illus., printed in French. France Pêche, 84, Rue Carnot, Lorient, France.

FUR SEALS:

"Storled Seal-Hunt," article, Trade News, vol. 11, no. 10, April 1959, pp. 3-5, Illus., processed.

Trade News, Department of Fisheries, Ottawa, Canada. Describes the adventures of the 8 sealing ships from Newfoundland and Nova Scotia operating in the Gulf of St. Lawrence and off the east coast of Labrador. This colorful and lucrative trade has been operating in this area for nearly a century. Early reports give accounts of good catches. The Canadian ships are aided by seal spotting aircraft and by the assistance of a representative of the Arctic Unit, Fisheries Research Board of Canada.

GEAR:

"Fishing with the South African Pursed Lampara," by C. G. Du Plessis, article, World Fishing, vol. 7, March 1958, pp. 57-58, printed. John Trundell (Publishers), Ltd., St. Richard's House, Eversholt St., London, N. W. 1, England.

A Method of Determining the Depth of Midwater Trawl Nets, by William Edward Barraclough, Circular no. 48, 5 pp., illus., printed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

"On the Relation Between the Length of Ground Rope of a Danish Seine and the Variation of its Gape," by Otohiko Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 9, 1958, pp. 514-517, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

GENERAL:

"Studies on Fishes of the Family Ophididae.
III--A New Species of Lepophidium from Barbados," by C. Richard Robins, article, Breviora, no. 104, April 13, 1959, 7 pp., illus., printed.
Museum of Comparative Zoology, Cambridge, Mass. (Also Contribution No. 221 from The Marine Laboratory, University of Miami, Miami, Fla.)

GIZZARD SHAD:

Age and Growth of the Gizzard Shad (DOROSOMA LACEPEDI) (Sesueur), in Lake Newman, Fla., by Frederick H. Berry, 14 pp., illus., printed. (Reprinted from Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, pp. 318-331.) Southeastern Association of Game and Fish Commissioners, P. O. Box 360, Columbia, S. C., 1958.

HERRING:

De Haringcampagne 1957-58 (The Herring Fishery, 1957-58), by Charles Gilis, no. 1, 1958, 31 pp., illus., printed in Flemish and French. Zeewetenschappelijk Instituut, Romestraat, 30, Oostende, Belgium.

The Herring from the Fuglsetfjord--a Supplement to "The Osterbø Herring," by Thorolv Rasmussen, 8 pp., illus., printed. (Report on Norwegian Fishery and Marine Investigations, vol. XII, no. 2, 1958.) A. S. John Griegs Boktrykkeri, Bergen, Norway.

"Herring Migrations in the Passamaquoddy Region," by R. A. McKenzie and B. E. Skud, article,

Journal of the Fisheries Research Board of Canada, vol. 15, no. 6, 1958, pp. 1329-1343, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Untersuchungen über die Deutsche 'Ölheringsfischerei' in der Nordsee im Jahre 1956" (Assessment of the German Oil Herring Fishery in the North Sea in 1956), by Heinrich Kuhl and Klaus Tiews, article, Berichte der Deutsche Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, band XV, heft 1, December 1957, pp. 58-69, illus, printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart, Germany.

HYDROGRAPHY:

Hydrography of the North-Western Approaches to the British Isles, by D. S. Tulloch and J. B. Tait, Scottish Home Department Marine Research No. 1, 1959, 32 pp., illus., printed, 10s. (about US\$1.40). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland.

Hydrography of Scottish Coastal Waters, by R. E. Craig, Scottish Home Department Marine Research No. 2, 1959, 30 pp., illus., printed, 10s. (about US\$1.40). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland.

INTERNATIONAL CONFERENCES:

Participation of the United States Government in International Conferences, July 1, 1957-June 30, 1958, Department of State Publication 6772, 286 pp., printed, 70 cents. Office of International Conferences, Department of State, Washington 25, D. C., May 1959. (For sale by the Super-intendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A reference guide to the official participation of the U. S. Government in multilateral international conferences and meetings of international organizations during the period July 1, 1957-June 30, 1958. For many of the conferences detailed data are presented on the composition of the U.S. delegation, principal officers, participation by other countries and organizations, and brief statements of the actions taken. Describes among others, the following conferences: United Nations Conference on the Law of the Sea (February 24-April 27, 1958), Geneva; Inter-American Tropical Tuna Commission, Tenth Annual Meeting (February 11-12, 1958), Panama; International North Pacific Fisheries Commission, Fourth Meeting (November 4-8, 1957), Vancouver, Committee on Biology and Research (October 28-November 4, 1957), Vancouver; International Commission for the Northwest Atlantic Fisheries, Eighth Annual Meeting (June 9-14, 1958), Halifax; International Fisheries Convention of 1946, Permanent Commission: Sixth Meeting (October 22-25, 1957), London; International Whaling Commission, Tenth Meeting (June 23-28, 1958), The Hague; North Pacific Fur Seal Commission, First Meeting (January 13-17, 1958), Washington, D. C.; General Agreement on Tariffs and Trade (GATT), Contracting Parties: Twelfth Session (October 17-NovemTHESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ber 30, 1957), Geneva; International Council for the Exploration of the Sea, Forty-Fifth Meeting (September 30-October 8, 1957), Bergen, Norway.

IRELAND:

Foyle Fisheries Commission, Seventh Annual Report (for the year ended September 30, 1958), Pr. 4958, 35 pp., illus., printed, 2s. (about 28 U. S. cents); Sixth Annual Report (for the year ended September 30, 1957), Pr. 4552, 35 pp., illus., printed, 2s. (about 28 U. S. cents); Fifth Annual Report (for the year ended September 30, 1956), Pr. 4057, 29 pp., illus., printed, 2s. (about 28 U. S. cents); and Fourth Annual Report (for the year ended September 30, 1955), Pr. 3467, 33 pp., illus., printed, 1s. (about 14 U. S. cents). The Foyle Fisheries Commission, The Courthouse, Lifford, Ireland. (For sale at the Government Publications Sale Office, G. P. O. Arcade, Dublin, Ireland.)

ISRAEL:

Bamidgeh (Bulletin of Fish Culture in Israel), vol. 10, no. 4, December 1958, 46 pp., illus., printed in English and Hebrew. Joint Agricultural Extension Centre, Division of Fisheries, Ministry of Agriculture, Tel Aviv, Israel. Contains the following articles: "The Fish Culture Research Station--Dor," by A. Yashouv; "Acclimatization of New Species in the Fishponds of the Station," by A. Yashouv; "Winter Culture of Carps at the Fish Culture Research Station--Dor," by A. Yashouv, and "The Excreta of Carp as a Growth Limiting Factor," by A. Yashouv.

MACKEREL

"Changes of Fat in Frozen Mackerel During Storage," by O. M. Mel'nikova and N. M. Khalina, article, Izvestila Tikhookeanskovo Nauchno-Issledovatelskovo Instituta Rybnovo Khoziaistva i Okeanografii, vol. 42, 1954, pp. 299-302, printed. Izvestila Tikhookeanskovo Nauchno-Issledovatelskovo Instituta Rybnovo Khoziaistva i Okeanografii, Vladivostok, U. S. S. R.

MENHADEN:

Length, Weight, and Age Composition of the Menhaden Catch in Virginia Waters, by J. L. Mc-Hugh, R. T. Oglesby, and A. L. Pacheco, No. 84, 18 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 4, no. 2, April 1959, pp. 145-162.) Virginia Fisheries Laboratory, Gloucester Point, Va.

OYSTERS:

Cooling Rates of Fresh Oysters, Central Laboratory Report, 11 pp., illus., processed, limited distribution. U. S. Department of Health, Education, and Welfare, Public Health Service, Bureau of State Services, Division of Sanitary Engineering Services, Milk and Food Branch, Shellfish Section, Washington 25, D. C.

"La Pêche et l'Ostréiculture dans le Quartier de Bordeaux en 1958" (The Fishery and Oyster Culture in the Bordeaux Area in 1958), by M. Lucas, article, <u>France</u> <u>Pêche</u>, vol. 40, no. 29, May 1959, pp. 37-38, printed in French. France Pêche, 84, Rue Carnot, Lorient, France.

PARASITES:

Concerning the Specificity of Fish Parasites, by S. S. Shulman, Fisheries Research Board of Canada, Translation Series, No. 177, 17 pp., processed. (Translated from Zoologicheskii Zhurnal, vol. 33, no. 1, 1954, pp. 14-25.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

PILCHARD:

The Pilchard of South Africa and of South West
Africa (SARDINOPS OCELLATA)-The Variations of Temperature in the Surface Layer of the
Sea Near Walvis Bay during 1954-57, with an
Analysis of Some Wind Data from Pelican Point,
by G. H. Stander, Investigational Report No. 35,
40 pp., illus., printed. South African Department of Commerce and Industries, Division of
Fisheries, Cape Town, Union of South Africa,
1958.

PORTUGAL:

Gremio dos Armadores Navios da Pesca do Bacalhau, Relatorio e Contas do Exercicio de 1958 e Orcamento para 1959 (Cod Fishing Vessel Owners' Guild, Statement of Operations for 1958 and Budget for 1959), 38 pp., illus., printed in Portuguese. A Comissao Revisora de Contas, Lisbon, Portugal, February 1959.

PRECOOKED FOODS:

A Study of Frozen Precooked Foods: Their Sanitary Quality and Microbiological Standards for Control, by A. E. Abrahamson, Leon Buchbinder, John Guenkel, and Milton Heller, 10 pp., illus., printed. (Reprinted from Association of Food & Drug Officials of the United States, vol. 23, no. 2, April 1959, pp. 63-72.) Department of Health, City of New York, Bureau of Food and Bureau of Laboratories, New York, N. Y. In the City of New York a microbiological study was made of 195 samples of frozen precooked foods of nationally known brands, obtained at the retail level. At this level about 76 percent were found to meet the Department of Health criteria of less than 100,000 colonies per gram and no Staphylococcus aureus. This is not a local problem but one of national scope. The standards used in the recent New York City studyare recommended for adoption as a starting point for the improvement of the sanitary quality of frozen precooked foods of the types encompassed by the study. Unless Federal microbiological standards for frozen precooked foods are soon established there is a great likelihood that various and varying levels of standards will be adopted by local and state agencies which may be of some help to the consumer but may not make it easier for the processor.

PRESERVATION:

"Use of Ascorbic Acid for Fish Preservation (Analytical Determination)," by Maria Carusi Di Fabio, article, <u>Progresso Veterinario</u>, vol. 11, 1956, pp. 876-880, printed in Italian. Associazione Nazionale Veterinari Italiani, Turin, Italy.

QUALITY:

"A Review of the Value of Volatile Reducing Substances for the Chemical Assessment of the THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Freshness of Fish and Fish Products," by Lionel Farber and Peter A. Lerke, article, Food Technology, vol. 12, December 1958, pp. 677-680, printed. <u>Food</u> <u>Technology</u>, The Garrard Press, 510 No. <u>Hickory</u>, Champaign, Ill.

"Studies on Protein Denaturation in Frozen Fish" (Parts I, II, and III), by J. I. M. Ironsides and R. M. Love, article, Journal of the Science of Food and Agriculture, vol. 9, September 1958, pp. 597-617, printed. Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England.

RECIPES:

Fish for Hospital Catering, 30 pp., illus., printed.
White Fish Authority, Lincoln's Inn Chambers,
2-3 Cursitor St., London, E. C. 4, England,
1959. An eye-catching booklet, illustrated with
color photos, which contains sections on the
therapeutic value of fish, a table of food values
of white fish, choosing fish for normal and
special diets, buying fish, preparation and storage of fish, sanitation, cooking, serving and
garnishing, keeping fish hot, fish recipes for
normal diets, and fish for special diets.

Fish for Industrial Catering, 46 pp., illus., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London E. C. 4, England, 1959. This useful booklet discusses fish and the problems of service, how to choose fish, sanitation, basic cooking methods for the canteen, and some useful tips when cooking fish. It also presents recipes for large quantity cookery for the canteen and cafeteria, the snack bar, the directors' dining room; preparation of shellfish; and sauces for fish.

Fish for School Meals, 24 pp., illus., printed.

The White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London E. C. 4, England, 1959. Making fish popular with children is worthwhile since it can bring welcome variety to the school menu. That is the aim of this booklet which discusses choosing and buying fish, controlling delivery, quality and freshness, storage, preparation, sanitation, choice of fish, cooking fish, frying, other cooking methods, serving fish to children, and useful hints. It also contains recipes for the preparation of fish and sauces, and tips for transporting hot prepared fish dishes.

Four Recipe Leaflets, 4 pp. each, illus., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London, E. C. 4, England. Contain recipes for the preparation of fish dishes. Titles of the leaflets are: "Have a Proper Meal with Fish;" "Sensible Slimming with Fish;" "Fish for Invalids;" and "Party Dishes with Fish."

SALMON:

Causes of the Fluctuations in Abundance of Sockeye Salmon in Kamchatka, by F. V. Krogius, Fisheries Research Board of Canada, Translation Series, No. 92, 5 pp., illus., processed. (Translated from Trudy Problemnikh i Tematicheskikh Soveshchanii Zin, no. 6, 1956, pp. 144-149.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

Concerning the Causes of a Peculiarity of the Pink Salmon of the Sea of Japan, by I. B. Birman, Fisheries Research Board of Canada, Translation Series, No. 142, 6 pp., illus., processed. (Translated from Zoologicheskii Zhurnal, vol. 35, no. 11, 1956, pp. 1681-1684.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Fisheries (Contributions of Western States, Alaska, and British Columbia to Salmon Fisheries of the North American Pacific Ocean, including Puget Sound, Straits of Juan de Fuca and Columbia River), volume 2, 80 pp., illus., printed. Washington Department of Fisheries, Seattle, Wash., 1959. Contains chapters on: the need for cooperative management and preservation of historic fishing rights; historical review of fisheries management; problems involved in management of Pacific fisheries; Canadian proposal for a 12-mile zone of territorial waters; interception of migrating fish; the problem of the Bonilla-Tatoosh Line; extension of treaty waters to include Johnstone Strait and Puget Sound; chinook, silver, sockeye, pink, and chum salmon; objectives of fish farming; fish protective investments in Washington, Oregon, Idaho, and California; calculated minimum contributions of hatchery releases to the catch of salmon on the Pacific Coast and costs Assessable to Hatchery Operations; and conclusions and recommendations. Also presents graphs and charts depicting salmon migrations and landings, as well as tables showing investments in hatcheries and production of salmon from liberations of hatchery-reared fish, among others.

Results of a Study of the Biology of Sockeye

Salmon, the Conditions of the Stocks and the Fluctuations in Numbers in Kamchatka Waters, by F. V. Kroglus and E. M. Krokhin, Fisheries Research Board of Canada, Translation Series, No. 176, 21 pp., illus., processed. (Translated from Voprosy Ikhtiologii, no. 7, 1956, pp. 3-20.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Statistics on Salmon Sport Fishing in the Tidal
Waters of British Columbia, 1958, 25 pp., illus.,
processed. Department of Fisheries of Canada,
Pacific Area, 1110 West Georgia St., Vancouver 5, B. C., Canada, May 15, 1959.

"Variations in Composition of Southeastern A-laska Pink Salmon," by Claude E. Thurston, article, Food Research, vol. 23, November-December 1958, pp. 619-625, printed. Department of Food Technology, University of California, Davis, Calif.

SARDINES:

Behavior and Reactions of the Pacific Sardine, SARDINOPS CAERULEA (Girard), Under the Influence of White and Colored Lights and Darkness, by Anatole S. Loukashkin and Norman Grant, 50 pp., illus., printed. (Reprinted from THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Proceedings of the California Academy of Sciences, vol. 29, no. 15, May 29, 1959, pp. 509-548.) California Academy of Sciences, San Francisco. Calif. This investigation was conducted in order to study experimentally the effects of various types of illumination on the Pacific sardine from the point of view of the behavior of the school as a unit and the ability of the fish to discriminate different colors of light. Out of the three colored lights -- green, blue, and red -- of both different and uniform light intensities, only the red light elicited what are called negative reactions. The experiments revealed three important factors in sardine reactions to the light and darkness; (1) the sardine is a phototactic animal; (2) the sardine is incapable of reacting differently to different intensities of the white light ranging from 0.01 to 38.9 foot-candles; (3) and the sardine is capable of discriminating qualitatively the colors of light of the three primary colors.

SCOTLAND:

Ninth Annual Report of the Supervisory Committee for Brown Trout Research, 1956-1957, Scottish Home Department Freshwater and Salmon Fisheries Research, No. 21, 14 pp., illus., printed, 4s. 6d. (about 63 U. S. cents). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland.

Scottish Fisheries Bulletin, No. 11, May 1959, 20 pp., illus., printed. Fisheries Division, Scottish Home Department, Edinburgh, Scotland. Contains, among others, the following articles: "Scottish Herring Fishery Forecast for 1959," by B. B. Parrish; "A New Fisheries Convention," by C. E. Lucas; "The Importance of Plankton in Maintaining Fish Stocks," by J. H. Fraser; "Deadly Plant Found in the Sea," by J. H. Fraser; "The Cod's 'Poor Relations'," by J. Mason; "Fluctuations in the North Sea Haddock Stocks--II," by R. Jones; and "The Greenland Shark," by Bennet B. Rae.

Tenth Annual Report of the Supervisory Committee for Brown Trout Research 1957-1958, Scottish Home Department Freshwater and Salmon Fisheries Research No. 23, 15 pp., illus., printed, 4s. 6d. (about 63 U. S. cents). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland.

SPAIN:

Investigacion Pesquera, vol. XII, October 1958, 134 pp., illus., printed in Spanish with English summaries. Instituto de Investigaciones Pesqueras, Universidad de Barcelona, Barcelona, Spain. Contains, among others, the following articles: "Fluctuaciones en la Pesqueria de Sardina de Castellon" (Fluctuations in the Sardine Fishery of Castellon), by M. G. Larraneta, P. Suau, and J. Lopez; "Capturas por Unidad de Esfuerzo en la Pesqueria de Sardina de Castellon" (Landings Per Unit of Effort in the Sardine Fishery of Castellon), by M. G. Larraneta, J. Lopez, and P. Suau; and "Estudio Biometrico Comparado de los Nodulos Insulinicos del Atun y la Albacora" (Comparative Biometric Study of the Insulin Nodules of Tuna and Albacore), by E. Balcells R. and Jose Planas Mestres.

Investigacion Pesquera, vol. XIII, November 1958, 133 pp., illus., printed in Spanish with English summaries. Instituto de Investigaciones Pesqueras, Universidad de Barcelona, Spain. Contains, among others, the following articles: "Estudio Comparativo del Crecimiento de las Sardinas, Sardina pilchardus Walbaum, de Barbate (Costa Sudatlantica Espanola) y Larache (Costa Atlantica de Marruecos)" (Comparative Study of Growth of the Sardine, Sardina pilchardus Walbaum, of Barbate (South Atlantic Spanish Coast) and Larache (Atlantic Moroccan Coast), by Julio Rodriquez-Roda; "Los Escombriformes Espanoles como Fuente de Insulina" (Spanish Trash Fish as a Source of Insulin), by Jose Planas Mestres and E. Balcells R.; and "Sobre el Poder de Pesca, Vulnerabilidad y Agregacion en la Pesqueria de Sardinas de Castellon" (On Fishing Power, Vulnerability and Concentrations in the Sardine Fishery of Castellon), by M.G. Larraneta.

SPONGES:

Natural History of the Marine Sponges of Southern New England, by Willard D. Hartman, Bulletin 12, 179 pp., illus., printed. Peabody Museum of Natural History, Yale University, New Haven, Conn., 1958.

ST. LAWRENCE SEAWAY:

"Impact of St. Lawrence Seaway on U.S. Foreign Trade and Shipping," by Ernst A, Van Es, article, Foreign Commerce Weekly, vol. 61, no. 21, May 25, 1959, pp. 24-26, 32, printed, single copy 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C.) With the inauguration of the St. Lawrence Seaway System on April 25, 1959, a new and important trade route has been opened to the merchant fleets of the world, reaching 2,400 miles inland from the Atlantic Ocean to the midcontinental industrial centers of the United States. The basic contribution of the Seaway to the development of foreign trade is the fact that it is now possible for most oceangoing vessels with a cargo-carrying capacity of 8,500 to 10,000 tons (compared with a maximum carrying capacity of less than 3,000 tons prior to deepening the channel to 27 feet) to load and discharge directly at all of the Great Lakes ports which provide adequate berthing facilities. The increased vessel capacity will be an important factor in the expansion of foreign trade, as it will increase the operating efficiency of shipping on the Seaway with a consequent reduction in ship operating costs.

TRAWLING:

Trawlfishing in the South-Eastern Caribbean (a report prepared for the Government of Trinidad and Tobago and the Caribbean Commission), 153 pp., illus., printed. Central Secretariat, Caribbean Commission, Port-of-Spain, Trinidad, 1955.

TRAWLS:

On the Choice of a Rational Shape for Trawl-Boards, by I. R. Matrosov, 9 pp., processed. (Translated from Rybnove Khozyaistvo, no. 1, January 1958, pp. 36-42.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England, 1958.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TUNA:

The Albacore Tuna Fishery of Oregon, by Irving W. Jones, Educational Bulletin No. 3, 11 pp., illus., processed. Fish Commission of Oregon, Portland, Ore., 1958. Presents descriptions of the history of the albacore tuna fishery off the Oregon coast, fishing methods, canning methods, and biology and research. Surprisingly, the Commercial albacore tuna fishery was not discovered until 1936, when 40,000 pounds were landed. "Before 1936," according to the author, "albacore had occasionally been taken by trollers fishing for salmon, but the fishermen in some cases threw them away as being some sort of unknown and probably worthless scrapfish. The credit for discovery of the fishery can be given in part to pilchard fishermen fishing in waters off the Oregon and Washington coast." Oregon landings continued to increase until 1944, when a peak catch of 22.5 million pounds was landed. In the succeeding 10 years, landings declined, but later began to show an increase.

"Éléments Nouveaux sur la Migration des Thons" (New Ideas on the Migration of Tunas), by Robert Lenier, article, France Pêche, vol. 40, no. 29, May 1959, pp. 26-34, illus., printed in French. France Pêche, 84, Rue Carnot, Lorient, France.

UNITED KINGDOM:

Fish from the Sea to the Table, 12 pp., illus., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London E. C. 4, England, 1959. A color-illustrated booklet principally for school children but so attractively presented as to be of general interest. Describes the different kinds of fish; how they are caught, landed, unloaded at port, and marketed; and how they are processed and quick-frozen. Also contains a map which shows where most of the edible fish are caught and how far the trawlers must go to seek their catches.

Fisheries of Scotland Report for 1958, 80 pp., illus., printed, 4s. 6d. (about 63 U.S. cents). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland, April 1959. This report discusses the changes which took place in the Scottish fishing fleet during 1958 as well as details of the catch. It also includes in the appendices reports on fisheries research and harbors. New fishing vessels of various types are making their appearance in the Scottish fleet each year and the modernization of their vessels by trawler owners continued last year at an even pace. A number of tables are included in the report which deal with quantities and values of fish landed, number of vessels and fishermen engaged in the fisheries, and grants and loans for the purchase of boats and gear. The Marine Laboratory at Aberdeen continued its investigations of herring, demersal, and shellfish fisheries. Research on salmon and brown trout has progressed at the Freshwater Fisheries Laboratory at Pitlochry. The program has included experiments in the protection of salmon nets from attacks by seals.

List of Recommended Names for the Sale of Fresh or Frozen Fish by Retail, 6 pp., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London E. C. 4, England, January 1959. The White Fish Authority, in consultation with the Local Authority Associations and the fishing industry, has prepared a Code of Practice indicating prescribed names under which fish should be sold in the retail markets. This information is presented in the form of a chart giving the names by which fish should be sold retail, other names by which fish are at present known, and scientific names of species.

U. S. S. R.:
"New Fishing Areas and New Fishes for the Industry in Far-Eastern Seas," by Theodor S. Rass, article, Voprosi Ikhtiologiim, vol. 4, 1955, pp. 71-81, processed. (Institute of Oceanology of the Academy of Sciences of the U.S.S.R.) A translation has been made by the Department of the Secretary of State of Canada, Foreign Language Division, Ottawa, Canada, 1957.

WHALING:

International Whaling Statistics, no. XXXIX, 72 pp., illus., printed, kr. 2.00 (about 28 U. S. cents). The Committee for Whaling Statistics, Oslo, Norway, 1958.

International Whaling Statistics, no. XXXX, 53 pp., illus., printed, kr. 2.00 (about 28 U. S. cents). cents). The Committee for Whaling Statistics, Oslo, Norway, 1958.



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* * * * *

Photograph on page 31--R. Silliman. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

NATIONAL FISH 'n' SEA FOOD PARADE--OCTOBER 19-25, 1959

The Fishing Industry and the U.S. Department of the Interior's Bureau of Commercial Fisheries are working together to encourage the increased use of fish and shellfish prod-

ucts during the "Fish 'n' Sea Food Parade"--October 19-25, 1959. A great deal of interest has been generated in this fall promotion, according to preliminary reports.

This is the Fishing Industry's fifth annual all-out promotion channeled over radio, television, newspaper, magazines, and other media. The many advantages of serving fish are being stressed. All types of fresh, frozen, canned, smoked, precooked, and cured fishery products and fish dinners are being advertised. Many retail stores and restaurants are making a concerted effort to display, stock, and promote fishery products during this year's 'Fish 'n' Sea Food Parade.'



Display material is available for retail food stores and restaurants, consisting of window posters, diecut paper posters, mobiles, and menu tents. Mayors and governors will be urged to issue "Fish 'n' Seafood Parade" proclamations.

Bureau of Commercial Fisheries field men are helping to obtain newspaper publicity and are distributing recordings for



radio stations, and also television slides and shorts. A special marketing bulletin has been distributed to food editors and home economists. Fact sheets with recipes have been released to restaurants, institutions, and schools. In addition, Bureau of Commercial Fisheries field men and home economists are available for appearances on radio and television.

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BUREAU OF COMMERCIAL FISHERIES

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Page



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, May 21, 1957.

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COVER: Underwater photograph of a school of skipjack in the Central Pacific taken from an observation chamber on board the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gibert. The observation chamber is a special blister built into the hull aft, below the water line and the fishing racks. The Bureau's Honolulu Biological Laboratory biologists are studying the behavior of skipjack tuna in the Central Pacific. This photograph was taken on July 13, 1959, 10-12 miles south of Barber's Point, Oahu, Hawaii. The fish had a mean length of 22 inches and ranged from 19 to 27 inches, or from 5 to 15 pounds.

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STORAGE LIFE OF PINK SHRIMP HELD IN COMMERCIAL AND JACKETED COLD-STORAGE ROOMS

By John A. Peters* and Daniel T. McLane**

ABSTRACT

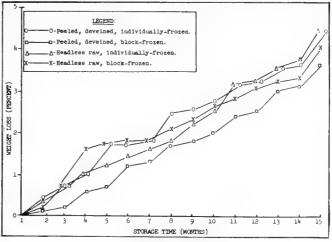
Tests were conducted to determine the frozen storage life of pink shrimp held at 0° F. to -5° F. in a commercial-type cold-storage room and in a Jacketed cold-storage room. Use of the jacketed storage room resulted in a significant extension of the storage life.

INTRODUCTION

Information on the keeping quality of frozen shrimp is needed by industry for the establishment of inventory and marketing practices that will enable it to supply

the consumer with products of uniformly high quality. This information is also required in developing standards and specifications for government purchases of this product.

One problem in the storage of frozen foods, including frozen pink shrimp (Penaeus duorarum), is that of dehydration. During frozen storage, moisture tends to sublime from the food and to condense on the surface of the evaporator coils in the cold-storage room. Over a period of time, the product may lose so much moisture in this manner as to become unpalatable.



Several approaches have been osed for the solution of this

Fig. 1 - Average percentage weight loss in commercial packages of shrimpstored at 0° to -5° F. in a commercial-type cold-storage room.

proposed for the solution of this shrimpstored at 0° to -5° F. in a commercial-type cold-storage room. problem. Among these are (1) to use glazes on unpackaged products, (2) to use packaging materials having very low moisture vapor transmission rates, or (3) to increase the relative humidity of the air in the storage room. The relative humidity can be most easily increased by enlarging the area of the surfaces used to cool the room. In a jacketed type of cold-storage room maximum cooling surface area is provided by cold air circulating through an enclosed jacket which completely surrounds the product storage space (Young 1952; Lentz 1955; Butler, Slavin, Patashnik, and Sanford 1956; Slavin, Peters, and Pottinger 1958). This provides a high relative humidity, and sublimation of moisture from the food thus is minimized.

peratures, of commercial packages of pink shrimp held in a commercial-type frozen-storage room and of those held in a jacketed one.

SAMPLES STORED IN A COMMERCIAL-TYPE STORAGE ROOM

Frozen pink shrimp are marketed in a number of different styles of packs, the principal ones being (1) headless raw shrimp (shells on) and (2) peeled and deveined

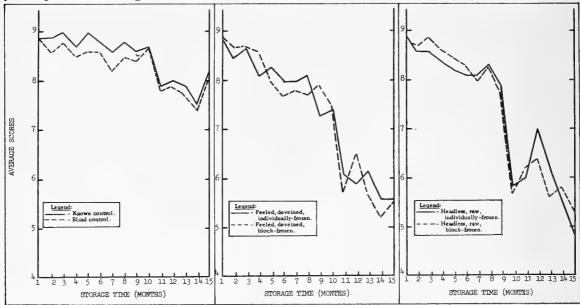


Fig. 2 - Average taste-panel scores for commercial packages of shrimp stored in a commercial-type cold-storage room.

raw shrimp. These shrimp may be frozen and glazed individually or in block form. The individually-frozen shrimp appeal to a large portion of the buyers because any amount of the shrimp thus frozen can be removed from the package without the necessity of thawing the entire contents. In our study of the samples held in the commercial-type storage room, the effect of these variations in pack were investigated.

Two measurements were made. One was a determination of the loss in weight of the packages in storage, and the other was a determination of the change in palatability of the shrimp.

A problem encountered in determining changes in palatability of a food which occur during frozen storage is that of providing a reference sample so that the taste tester can keep in mind how the product tasted originally. Stansby (1955) has suggested the packaging of fishery products in hermetically-sealed tins as a method of preserving the original palatability. In the preparation and storage of control samples for use in the present experiment, advantage was taken of this and of the fact that frozen foods change least when held at very low temperatures.

The details of the experiments and the results are given in the following subsections.

PREPARATION OF SAMPLES: The shrimp used in this study were packed using typical commercial packaging materials and were frozen in a modern shrimp plant in Tampa, Fla., under the supervision of a member of the Laboratory.

The individually-frozen samples consisted of peeled and deveined or headless raw shrimp that were frozen on trays in a blast freezer, glazed by dipping in fresh water, and packed in $2\frac{1}{2}$ -pound-size one-piece waxed paperboard cartons. These

cartons were overwrapped with waxed, opaque, bleached sulfite paper. The block-frozen samples consisted of peeled and deveined or headless raw shrimp that were packed in $2\frac{1}{2}$ -pound-size one-piece waxed paperboard cartons. Water was then added; the cartons were overwrapped with waxed, opaque, bleached sulfite paper; and the packaged shrimp were frozen in a blast freezer. The packages of individually-frozen and block-frozen shrimp were stored for several days at 0° F. in the processing plant. They were then packed with dry ice in insulated shipping containers and sent to the laboratory at East Boston by air freight. The samples were still solidly frozen when received at the Laboratory, where they were removed from the shipping containers and put in storage at 0° F. to -5° F.

A control sample was prepared by repacking some of the headless raw individually-frozen and glazed shrimp from the original cartons into No. 10 C-enamel cans. The cans of shrimp were filled with fresh water (cooled to 35° F.), sealed under 27 inches of vacuum, and frozen to -25° F. in the Laboratory's blast freezer.

STORAGE OF THE SAMPLES: The control sample was stored at -25° F. The commercial packages of individually-frozen and block-frozen shrimp were stored at 0° F. to -5° F. in a com-

at 0° F. to -5° F. in a commercial-type cold-storage room with overhead evaporator plates. The relative humidity of this storage area, as measured with an electric hygrometer, varied from 70 to 80 percent. Sufficient samples were put in storage to permit monthly tests for a period of 15 months.

WEIGHT-LOSS TESTS: The loss in weight of the package gives a quantitative indication of the amount of dehydration that has taken place. The test can be made with considerable precision.

PROCEDURE: At the beginning of the storage period and each month during the test, the commercial packages

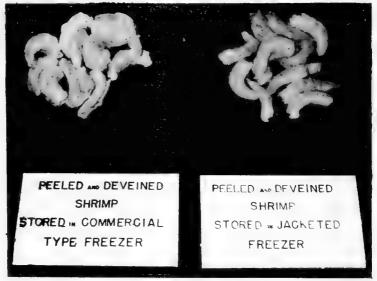


Fig. 3 - Appearance of frozen shrimp stored for 9 months at 0° to -5° F. in a commercial-type freezer and in a jacketed freezer.

of block-frozen and individually-frozen shrimp were weighed in the storage room using a beam balance accurate to 1.0 gram.

RESULTS: The average percentage weight loss of the various samples during 15 months storage is shown in figure 1. Both of the individually-frozen samples showed a weight loss of 4.4-percent; the block-frozen samples showed a 4.0-percent weight loss for the headless raw shrimp and 3.5 percent for the peeled and deveined shrimp. The slightly greater weight loss of the individually-frozen and glazed samples may be due to the larger amount of product surface area that is exposed and the larger amount of air space within the package as compared with the block-frozen samples.

PALATABILITY TESTS: Although palatability tests cannot be made with precision, owing to the human factor, they nevertheless are needed to give a practical interpretation of the weight loss tests. Palatability tests indicate the point where dehydration results in a noticeable change in palatability.

PROCEDURE: Two packages of shrimp from each sample were removed from storage at monthly intervals, examined in the frozen state for dehydration, and then cooked for evaluation by a taste panel comprised of eight members of the laboratory staff. Preliminary taste tests were conducted to acquaint the panel with this product.

Prior to each taste test, the frozen shrimp were thawed in running cold water. The headless raw samples were peeled. Each lot of shrimp then was cooked for 5 minutes in slightly salted boiling water and was cooled in the chill room (35° F.) for serving to the taste panel. At each taste test, four samples were served to the panel. The panel was instructed to compare the quality of three unknown samples with a known -25° F. control sample (known control). As a check on the accuracy of the panel, another of the -25° F. control samples was included as one of the three unknown. This sample was referred to as the blind control. Each sample was scored by the eight taste panel members for appearance, odor, flavor, texture, and over-all quality. The samples were rated by the panel on a scale of excellent, very good, good, fair, borderline, slightly poor, poor, very poor and inedible. In calculating the results, numerical values from 9 excellent to 1 inedible were assigned and the gross average score of the five quality factors for each sample was calculated.

Table 1	Table 1 – Average Taste-Panel Scores on Commercially-Packaged Samples of Shrimp Stored at 0° to -5° F. in a Commercial-Type Cold-Storage Room											
		Average Taste-Panel Scores ¹ /										
Storage Time	Known Control ² /	Blind Control 3/	Peeled, Deveined, Individually Fro- zen, and Glazed	Peeled, Deveined, Block-Frozen, and Glazed	Headless Raw In- dividually-Frozen and Glazed	Headless Raw Block-Frozen and Glazed						
Months												
1	8.9	8.9	8.9	8.9	8.9	8.9						
2	, 8.9	8.6	8.5	8.7	8.6	8.7						
3	$\frac{4}{9.0}$	8,8	8.7	8.7	8.6	8.9						
4	_ , 8.7	8.5	8.1	8.6	8.4	8.7						
5	5/ 9.0	8.6	8,3	8.0	8,2	8.5						
6	8.8	8,6	8.0	7.7	8.1	8.3						
7	8,6	4/8.2 5/8.5	8.0	7.8	8.1	8.0						
8	8.8	5/8.5	8.1	7.7	8.3	8.3						
9	8.6	8.4	7.3	7.9	7.9	7.6						
10	8.7	8.7	7.4	7.5	5.8	5.7						
11	7.9	7.8	6.1	5.7	6.0	6.2						
12	8.0	7.9	5.9	6.5	7.0	6.4						
13	7.9	7.7	6.2	5.7	6.2	5.6						
14	7.5	7.4	5.6	5.2	5.5	5.8						
15	8.2	8.1	5.6	5.5	4.9	5.3						

1/S cores of 9 = excellent, 8.0 - 8.9 = very good, 7.0 - 7.9 = good, 6.0 - 6.9 = fair, 5.0 - 5.9 = borderline (should not be marketed), and 4.0 - 4.9 = slightly poor (unmarketable).

2/ Stored in hermetically-sealed cans at -250 F. Taste panel was informed of the identity of this sample.

3/ Same as known control but identity was not revealed to taste panel.

4/Preference became significant at 5-percent level of probability.
5/Preference became significant at 1-percent level of probability.

RESULTS: The average taste-panel scores for the various samples are given in table 1. In figure 2 these data are plotted to show the trend of the loss in quality of the shrimp during frozen storage. The curves show a gradual decrease in quality of the commercial samples of shrimp during the first 9 months of frozen storage followed by a much faster rate of quality loss after this point.

Application of the rank test for significance of differences (Kramer 1956) to the average scores given by the taste panel to the various samples shows that (1) the preference for the known-control samples over the commercial samples became significant at the 5-percent level of probability after 3 months of frozen storage and at the 1-percent level of probability after 5 months and that (2) the preference for the blind control sample over the commercial samples became significant at the 5percent level of probability after 7 months of frozen storage and at the 1-percent level of probability after 8 months. These results indicate that no appreciable difference existed between the control samples stored at -25° F, and the commercial samples stored at 0° F. to -5° F. until after the seventh or eighth month of frozen storage because the taste panel was unable to distinguish, with statistical significance, the quality difference between the blind control and the commercial samples until after that period of storage had elapsed.

The marked change in taste-panel scores after the ninth month of frozen storage corresponds to the development of excessive dehydration of the shrimp in the commercial packages. At this time, the commercial samples of block-frozen and individually-frozen shrimp were considered to be of unmarketable quality because of their very poor appearance. It was found, however, that the dehydrated shrimp rehydrated to such an extent during water thawing and cooking that they were acceptable to the taste panel.

The control samples stored at -25° F. in hermetically-sealed containers showed an increase in rate of quality loss after 10 months of frozen storage but were

Table 2 - Average Taste-Panel Scores on Commercially-Packaged Samples of Shrimp Stored at 0° to -5° F. in a Jacketed Storage Room or Commercial-Type Still-Air Storage Room Average Taste-Panel Scores 1/ on Samples of Peeled, Deveined, Individually-Frozen and Glazed Storage Blind Known Shrimp Stored at 0° to 5° F. in Control2/ Control3/ Time Commercial-Type Jacketed Storage Room Storage Room Months 4/8.1 8.6 5/7.6 8.0 7.9 1/Scores of 9 = excellent, 8.0 - 8.9 = very good, 7.0 - 7.9 = good, 6.0 - 6.9 = fair, 5.0 - 5.9 = borderline (should not be marketed), and 4.0 - 4.9 = slightly poor (unmarketable). 2/Stored in hermetically-sealed cans at -25° F. Taste panel was informed of the identity of this sample. 3/Same as known control but identity was not revealed to taste panel.
4/Preference over sample stored in commercial-type storage room is not significant. 5/Preference over sample stored in commercial-type storage room is significant at 1-percent level of probability.

still of good-to-very-good quality at the fifteenth month of frozen storage (the end of the test). Packaging shrimp in a hermetically-sealed container and storing them at a temperature of -25° F. therefore resulted in at least a 6 months increase in keeping quality over that of commercially-packaged shrimp stored at 0° to -5° F.

CONCLUSIONS: (1) The average weight loss of commercial packages of pink shrimp stored in a commercial-type cold-storage room at 0° to -5° F. was from 1.8 to 2.5 percent after 9 months and from 3.6 to 4.4 percent after 15

months. Slightly higher losses occurred in the individually-frozen and glazed samples.

- (2) Commercial samples of peeled and deveined or headless raw pink shrimp, frozen individually or in block form, were of unacceptable quality after 9 months of 0° to -5° F. storage in a commercial-type cold-storage room because of excessive dehydration.
- (3) No significant differences in storage life were attributed to the style of pack employed in the commercial samples of peeled and deveined or headless raw pink shrimp that were frozen individually or in block form.
- (4) Pink shrimp packed in hermetically-sealed containers and stored at -25° F. were of good quality for at least 6 months longer than were pink shrimp that were packed in commercial packages and stored at 0° to -5° F. in a commercial-type cold-storage room.

SAMPLES STORED IN A JACKETED STORAGE ROOM

Owing to the tendency of taste testers to become fatigued quickly, the number of samples in the over-all experiment had to be kept small. It therefore was decided to limit the studies concerning the jacketed storage room to the use of peeled, deveined, individually-frozen pink shrimp--this being the product likely to show the greatest change.

The samples used in this phase of the study were part of the lot of commercial packages of peeled and deveined, individually-frozen pink shrimp described previously in the section on samples stored in a commercial-type cold-storage room. The control sample was also the same as the one described in that phase of the test.

STORAGE OF THE SAMPLES: The packages of frozen shrimp were put in storage at 0 to -5 F. in a jacketed cold-storage room. The design of this type of

room provides high humidity in the storage area, which in this instance was found to be between 90 and 95 percent (Slavin, Peters, and Pottinger 1958).

PALATABILITY TEST: Procedures: After 9 and 12 months of frozen storage in the jacketed room, samples of the peeled and deveined, individually-frozen shrimp were removed from storage, examined for dehydration, and then prepared in the manner described in phase 1 of this study for serving to the taste panel. At the same time, samples of the known control, blind control, and peeled and deveined, individually-frozen shrimp from the commercial-type storage room were served for comparison.

RESULTS: Examination of the samples of shrimp from the jacketed storage room after 9 and 12 months of frozen storage showed no significant dehydration compared with excessive dehydration of similar samples stored at the same temperature in the commercial-type cold-storage room (fig. 3).

The results of taste-panel tests comparing the quality of the shrimp after 9 and 12 months of storage in the commercial-type storage room and after the same length of time in the jacketed storage room are shown in table 2. The scores for the shrimp stored in the jacketed storage room are significantly higher than those for the shrimp stored for the same period of time and at the same temperature in the commercial-type storage room. It is therefore apparent that the packaging materials used were inadequate to prevent dehydration and to maintain high quality for longer than 9 months under ordinary commercial storage conditions. Even with the use of this package, however, high quality was maintained for at least 12 months by storing the shrimp in a high-humidity storage room, where dehydration was at a minimum.

CONCLUSION: Commercial samples of pink shrimp stored at 0° to -5° F. in a high-humidity jacketed storage room were of good quality for at least 3 months longer than were similar samples stored at the same temperature in the commercial-type cold-storage room.

SUMMARY

One approach to the solution of the problem of dehydration in frozen foods is the use of a jacketed freezer which maintains a high relative humidity in the product storage area. In the present study, both a commercial cold-storage room, with a relative humidity of 70 to 80 percent, and a jacketed cold-storage room, with a relative humidity of 90 to 95 percent, were used. The effect of dehydration was determined by measurement of loss of weight and loss of palatability.

In the use of the commercial storage room, the keeping quality at temperatures of 0° to -5° F. of commercial packages of pink shrimp that had been prepared in the following manner was studied: (1) peeled and deveined and (a) frozen individually or (b) frozen in block form and (2) headless raw and (a) frozen individually or (b) frozen in block form. For control, samples hermetically sealed in tin cans and held at -25° F. were used. It was found that with the commercial pack, the loss in weight was 1.8 to 2.5 percent after 9 months and 3.6 to 4.4 percent after 15 months. Owing to dehydration, the shrimp stored for 9 months or longer were of unacceptable quality. No differences in storage life were attributed to the style of pack. The control samples packed in hermetically-sealed containers and held at -25° F., however, were of good quality for 6 months longer than were the commercial samples.

In the use of the jacketed storage room, the keeping quality at temperatures of 0° to -5° F. of commercial packages of the peeled and deveined, individually-frozen pink shrimp were studied. It was found that these shrimp were of good quality for at least 3 months longer than were similar samples stored at the same temperature in the commercial cold-storage room.

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ELECTRICAL FISH DIVERSION SCREEN IN ENGLAND

To reduce the annual kill of seatrout and salmon, an electric screen has been installed about 1 mile above the Low Wood Power Station on the River Leven.

Designed for use in a normal water depth of 2.5 feet and also when tidal influence raised the water level below the turbines to 7 feet, the screen is a steel

bridge from which are hung sixty 2-inch steel tubes graded to the river banks and bottom and loaded with 3-phase alternating current at 25 volts per phase at 50 cycles. The current consumption of each phase is about 1.5 amperes at low water, 2.3 amperes at high water; thus the total consumption is from 4.5 to 6.9 amperes.

In tests of the installation. salmon kelts in wood boxes seemed comfortable 5 feet downstream from the screen but were uncomfortable when put within 3 feet of it.



Brown trout (0.75-inch), used in tests to study the effect on migrating smolts, were uncomfortable within 9 inches of the screen. A 15-second stay between electrodes immobilized the fish; they recovered in 15 seconds after removal from the field. Held between electrodes for 1 minute, they did not recover. When freed upstream of the screen to be taken through it by the flow, many were killed, sinking quickly beneath the electrodes.

This first 3-phase alternating-current screen of its type to be set on any river in the country was installed with the cooperation of Mr. Hartley of the Ministry of Agriculture, Fisheries and Food. (L. Steward, Fisheries Officer, Lancashire River Board (The Progressive Fish-Culturist, July 1959), Lancaster, England.)

SURINAM FISHERY EXPLORATIONS, MAY 11-JULY 31, 1957

By James B. Higman*

SUMMARY

Shrimp explorations in Surinam coastal waters, by the Surinam Fisheries Department from April to October 1957, resulted in the location of four species of commercially-desirable shrimp. A Florida-type shrimp trawler was chartered for the work.

Commercial quantities of pink-spotted shrimp ranging from 10 to 25 individuals per pound (heads-off) were caught at rates between 195 and 470 pounds per night, in depths of about 23 to 40 fathoms, using 68- and 89-foot trawls. In 10 to 18 fathoms, brown shrimp and sea bobs were taken in mixed catches. Commercial quantities of those two species of shrimp were scattered and were mixed with considerable quantities of fish. Catches of Penaeus schmitti, a shrimp closely related to the white shrimp of the southern United States, were not of commercial quantity.

BACKGROUND

The 1957 Surinam exploratory fishing program was carried out as a direct result of an encouraging preliminary trawling survey made by the Surinam Fisheries Department in 1953 (F&WS 1954a). The 1953 survey demonstrated the presence of shrimp and fish potentials in the offshore waters, and it led the Surinam Government to contract for further exploratory fishing in 1957. A Florida-built shrimp trawler was chartered to carry out trawling operations from April through June 1957. Results were highly satisfactory, and the vessel was re-chartered for a period extending from mid-July through October.

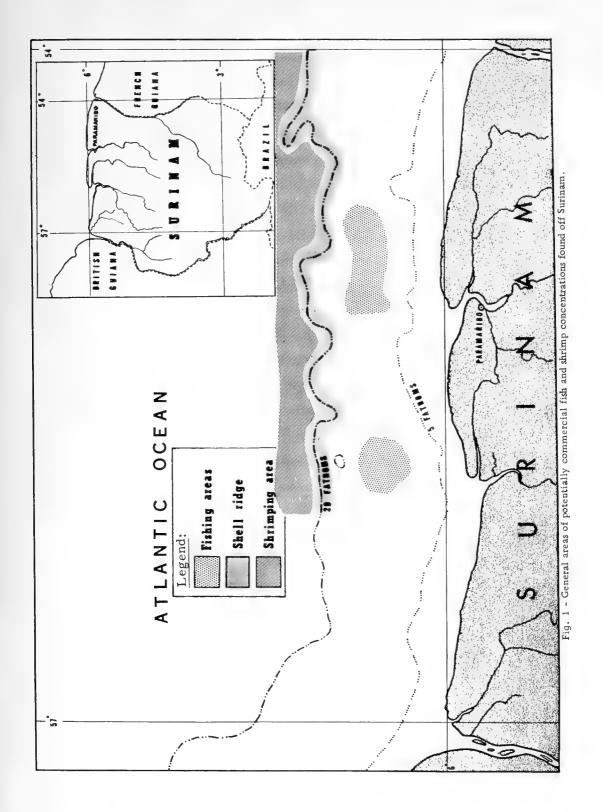
This entire program was planned and supervised by the Surinam Fisheries Department. The primary objective of the portion of the survey extending from April through June 1957 was to determine the species of fish and shellfish present in waters inside the 40-fathom curve and to survey the distribution and availability of these species. Most drags were made with a $10\frac{1}{2}$ -foot try net because of the belief that use of this gear could most rapidly give a comprehensive knowledge of the fauna. A secondary objective, during the same period, was to make production-type drags for shrimp and fish with 68- and 89-foot shrimp trawls. The primary objective of the second portion of the survey, from July through October, was to determine the availability of commercial quantities of shrimp and fish. This was attempted by means of production-type fishing.

At the invitation of the Surinam Government an observer from the U.S. Bureau of Commercial Fisheries accompanied the exploratory fishing vessel during all cruises carried out from May 11 to July 31, 1957. This report covers activities observed and results obtained during that period.

AREA INVESTIGATED

Surinam, formerly Dutch Guiana, is situated on the northeast coast of South America (fig. 1). Paramaribo, the capital and base of exploration, is located 18 miles upstream from the mouth of the Surinam River. Four other large rivers empty into the South Atlantic Ocean along the Surinam coast. Of these, the Corentyne on the west and the Maroni on the east, form natural boundaries between Surinam and Briish and French Guiana. The coastline is flat with unbroken expanses of forest and mangrove swamp; and the lack of bays, lagoons, or other distinct features except river mouths, causes an appearance of uniformity when the Guianas are approached from the sea. This lack of landmarks, and the absence of navigational aids other

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than the Surinam River light vessel and the radiodirection-finder station at Paramaribo, causes difficulties in position finding for fishing vessels. Equipment essential to operating in this area, therefore, includes a radiodirection-finder and a depth recorder.

TRAWLING BOTTOM

For orientation purposes the Surinam coastal waters, to a depth of 40 fathoms, have been divided into four zones on the basis of differences in bottom conditions

		LUIC I	* 1311111	, 109	212/ 1 00	quette, Suri	10211 1 13	HCIICS DA	pioracions	1507 110	duction-19	pe Diags	,
ndex	Station		Position W.	Date		ing Time	Depth	Bottom	Gear	Brown	Pink-Spotted	Sea Bobs2/	Miscellaneous
No.	No.	No. Lat.	Long.	1957	Time on Bottom	Duration of Drag (Minutes)	Fathoms	Туре	Used	Shrimp 2/ (Heads off)	Shrimp (Heads off)	(Heads off)	Shrimp (Heads off)
1	140	06°24'	54 ⁰ 551	5/30	0830	90	14		68-Foot	(Qu	(Heads off) antity in Lbs. an	d Number Per	Pound)
	140				0630	30	14	M	Flat Trawl	3#(40-50)			-
2	145	06°21'	54° 591 54° 541 54° 471 54° 561	- 11	1058	90	14	М		42#(30-35)	_	10# (Lg.)	-
3	150	06°20' 06°23' 06°22'	54 541		1245	120	13-11	M	"	18#(30-35)	-	25# (Lg.)	-
4 5	155 203	06 23	54 47	6/11	1600 1100	90	13 13-14	M	,,,	6#(30-35)		5# (Lg.) 120# (Lg.)	Less than 1#
	203			0,11		30	10.14	147			-	120# (Lg.)	P. schmitti (21-25)
6	208	06°22'	55°03†	17	1350	90	13	M	"	-	-	80# (Lg.)	Less than 1# P. schmitti
7	241	06°20' 06°23' 06°40'	54°45° 54°45° 55°26°	6/16	0805	90	13-15	M. Sh	- "	1#(36-40)			A . SCOMMIN
8	245	06°231	54°45		1050	65	12-13	M	"	90/(26-30)	-	"Few"	-
9	260			6/20	1830	180	23-24	M, S, Sh	"	-	163# (No count recorded	-	•
10	267 273	06°42'	550431	6/21	2205 0120	180	24 24	M, S, Sh	17	-	115# (10-15)		
11	293	060271	55°43' 55°41' 55°05'	6/28	1010	90	14	M, S, Sh M, Sh	11	160# Whole	88#		2# P. schmitt
				0,00						Mixed Browns & Sea Bobs			ZV I. Bessie
13	297	06°451	55°17'	- 11	1900	180	24	M, S, Sh	11	-	1804 (?)	-	
14	311	06°48'	55 33 55 35 55 27 55 21 55 17 55 16 5	7/19	2010	215	24	M,S	11	-	160#(15-20)	-	-
15 16	316 322	06 40	550391	7/20	0010 0400	215 210	25-26 27-29	M,S,Sh,Sp M,S,Sh	- 0	 	130#(15-25) 65#(15-20)		
17	328	060521	55033		1905	235	29	M, S, Sh	10		130#(15-25)	-	
18	337	06° 52¹ 06° 49¹ 06° 48¹ 06° 47¹	55°21'	7/21	2330	230		M.S.Sh	11	-	175#(15-25)	-	-
19	341	06°48'	55°17'	11	0340	180	27-25	M,S	" "	-	175#(15-26)		
2.0	347	060471	550161		1915	235	25-24	M,S	11	-	250#(15-25)	-	
21	254 360	06 441	55 14	7/22	2326 0820	270 150	24-25	M,S M,Sh	11		225#(15-25)		-
22	361	06°44¹ 06°19¹ 06°49¹	55°14' 55°15' 55°21'	7/24	2210	190	24-25	W, Sit	89-Ft. West- ern Jib	3/	3/	3/	
24	368	060481	55°291	7/25	1905	200	25-24	M, Sh	Trawl	-	150#(15-25)	-	
25	374	06°48¹ 06°45'	55,471	- "	2250	225	24-25	M, Sh		-	75#(15-25)		
26	381	060461	55° 29' 55° 47' 55° 59'	7/26	0300	210	25-26	M, Sh	68-Foot Flat Trawl		60#(15-25)	_	_
27	386	06°37'	55°55'	- 11	1906	210	20-17	M, Sh	89-Ft. West-	5#(15-25)	10#(15-25)		
28	392	060331	550 541	- 11	2305	210	18-17	M, Sh	ern jih Trawi	5#(15-25)	5#(15-25)	-	-
29)	06°33'	55° 541 55° 481	7/27	0405	180	14-12	M	"	20#(26-30)	-	4½#Tails	4.# P. schmi (12-15)
30	394	06°50'	55°28'	"	2015	210	25-26	M, Sh		_	150#(15-25) 100#(15-20)	-	
31	400	06 50'	550184	7/28	2400	210	26-25	M, Sh	- "		100#(15-20)	-	-
32	406	06°50' 06°50' 06°50'	55° 28' 55° 18' 55° 16' 55° 13'	11	0445 1903	150 210	26-25 26-28	M,Sh M,Sh	68-Foot	2#(10-15)	50#(15-25) 210#(15-25)	-	
34	416	060501	55°03'	11	2250	240	28-29	м	Flat Trawl		180#(15-25)	-	-
35	421	06050	540491	7/29	0310	210		M	<u>"</u>		80#(15-25)	-	-
36	426	06°50' 06°50' 06°51'	54° 49' 54° 39' 54° 33'	-	1900	240	28-30	М	- 11		115#(15-25)		-
37	433	06°51'	54 331	- 11	2325	240	30-35	M		55#(15-25)	55#(15-25)	-	
38	439	06°57, 5' 07°03' 06°25'	54°24' 54°23' 55°57'	7/30	0345	180		M		5/1#(15-25)	5/1#(15-25)	-	
39	444	07 031	54 231	7/31	0530	240 180	4/37-30	M.S M		10#(15-25)	10#(15-25)		-
40	453	06 25	55 57	1/31	0530	100	13-8	141	"	Mixed Brown & Sea Bobs 25# whole Shrimp	,		:

Traviling stations were numbered in requence, from Station 1 through Station 453. Try-net drags are not included in the table, causing a break in the continuity. To preserve the original station designation and still Number 100-level by a flag indicates prouded. Station provided by a flag indicates prouded distribution. Number in parameters refer to the healt-off count per pound.

The depth-sounder used during the narvey prosened a maximum range of 220 feet (approximately 36.6 (asthoma). Depths in excess of this are, therefore, estimated.

Travil badly disamated by parishin-part of extent ions.

and faunal groupings. These four somewhat arbitrary zones and their approximate depth limits are: the inshore zone from 0 through 4 fathoms, the intermediate zone from 5 through 18 fathoms, the shell-ridge zone lying between 19 and 23 fathoms, and the offshore zone from 23 through 40 fathoms.

INSHORE ZONE: The inshore waters, shallower than five fathoms, are irregularly obstructed by extensive soft "sling" mud banks which extend from 2 to 12 miles offshore (Hydrographic Office 1935). These banks are subject to frequent shifting by tides and strong westerly currents, and their presence makes trawling inside 5 fathoms extremely hazardous (Whiteleather and Brown 1945). The shallows and the marshy areas adjacent to the river mouths may serve as nursery grounds for some species of shrimp found off that coast. The water in the inshore zone is the color of creamed coffee due to considerable material in suspension.

INTERMEDIATE ZONE: Beyond five fathoms, trawlable bottom, largely consisting of soft, sticky, gray mud, extends out to approximately 18 or 19 fathoms where it gives way to rougher, dead shell bottom. With the exception of one try net, lost on an obstruction at 06°22' N. latitude and 55°06' W. longitude in 14 fathoms, no extensive gear damage was encountered in the zone. Some net damage, however, was caused by sharks and sawfish; particularly when large fish catches were made. The water color in the intermediate zone changes from brown on the inshore side to milky green offshore.

SHELL RIDGE ZONE: Within the general depth interval, 19 to 23 fathoms, a zone of rough bottom apparently parallels most of the Surinam Coast. This is unsuitable shrimp trawling bottom; responsible for some torn gear but no net losses. Although the ridge is narrow along the eastern and central Surinam coast, exploratory operations indicate a widening in the vicinity of the Coppename River and disruption of the ridge in the vicinity of the Maroni River. Try-net catches included dead encrusted shells, dead coral, gorgonids, and sponge.

OFFSHORE ZONE: In water deeper than 23 fathoms hard trawlable bottom, consisting predominately of gray mud and fine shell, extends to at least the 40-fathom depth curve--the limit of the trawling gear. Scattered through this zone are extensive patches of soft blue and black mud. Large expanses of the gray mud bottom are covered with a fine moss-like gorgonids growth which clogged the trawl meshes. This caused some difficulty in trawling, because the additional drag reduced the fishing ability of the net. Sun-drying the net, followed by vigorous brushing, was the only effective method of removing the material. Five-hour drags in one direction were made in the zone without gear damage, but it is not entirely free from snags. At approximately 06 50' north latitude and 55 26' west longitude a hang-up on an unidentified object stopped the winch while "hauling back." The water color in this zone is the deep blue that is characteristic of the open ocean.

VESSEL AND PERSONNEL

A typical Florida-type shrimp trawler, the Coquette, was used in this survey (fig. 2). Its registered dimensions are: length, 61.4 feet; beam, 18.4 feet; draft, 8.5 feet; gross tonnage, 64.82; and net tonnage, 31.0 tons. The vessel is Dieseldriven and delivers 120 shaft hp. at 1,000 r.p.m. The crew, during the exploratory survey, consisted of two United States citizens and one Surinam national.

GEAR

The $10\frac{1}{2}$ -foot try net used during this survey was constructed of 2-inch mesh $\frac{1}{2}$ /, 15-thread-tarred-cotton webbing with the exception of the bag or cod end which was of 1-inch mesh, 21-thread-tarred-cotton webbing. The headrope and footrope were tied directly to 2- by 1-foot try-net doors which were rigged from a 15-foot chain bridle, secured by shackles and a swivel, to the try-net cable. Try-net drags were also made with 8-, $13\frac{1}{2}$ - and $17\frac{1}{2}$ -foot try nets constructed and rigged in similar fashion.



Fig. 2 - Florida-type shrimp trawler Coquette used in 1957 Surinam explorations.

A 400-mesh flat trawl, with a headrope measuring 68-feet 7-inches long 1/ All mesh sizes refer to stretched-mesh measure.

and a footrope measuring 78 feet 7 inches long, was used for most production-type drags (fig. 3). The body was made of 2-inch mesh, 15-thread-tarred-cotton webbing;



Fig. 3 - Retrieving the cod-end of the 68-foot snrmp trawl aboard the $\underline{\text{Coquette}}$.

and the bag was of $1\frac{3}{4}$ -inch mesh 42-thread-tarred-cotton webbing. The bag was protected by chafing gear. Six-foot extensions of the headrope and footrope were used in attaching the trawl to the 10-foot by 42-inch trawl doors. A tickler chain measuring 6 feet shorter than the leadline was used when fishing this net.

A few offshore drags were made with a 450-mesh western jib trawl which measured $89\frac{1}{2}$ feet on the headrope. The body was made of $2\frac{1}{4}$ -inch mesh, 18-threadtarred-cotton webbing and the bag was of $1\frac{3}{4}$ -inch-42-thread-cotton webbing. This net was fished with 7-foot extensions and a $101\frac{1}{2}$ -foot tickler chain.

FISHING RESULTS

INSHORE ZONE, 0 THROUGH 4 FATH-OMS: Trawling in depths shallower than five fathoms was risky because of the danger of bogging the trawl doors and the net in the extremely soft mud bottom. Eight 15-minute try-net drags were attempted in the zone in a restricted area east of the mouth of the Surinam River. Shrimp catches consisted entirely of small numbers of sea bobs ranging from

100 to over 300 individuals per pound (heads on). The total weight of individual trynet catches ranged from 2 to 20 pounds. Sea catfish, small sea trout, and croakers comprised the bulk of the weight of the catches. No production-type fishing was attempted in this zone.

INTERMEDIATE ZONE, 5 THROUGH 18 FATHOMS: Shrimp catches: Daytime try-net coverage in the intermediate zone from the mouth of the Surinam River west to the Coppename River and east to the Maroni River was extensive. The portion of the zone lying west of the Coppename was not investigated during the 1957 survey. Results of the try-net work indicated a discontinuous distribution of brown shrimp. Even with this interrupted distribution pattern, catches of commercially-valuable quantities of brown shrimp were made in two instances with the 68-foot trawl. At station number 145, in 14 fathoms, 42 pounds of brown shrimp (heads off) resulted from a drag of approximately $1\frac{1}{2}$ hours, and at station 245, 90 pounds of brown shrimp (heads off) were obtained in 65 minutes. The shrimp ranged in size from 26 to 35 tails per pound.

Sea bobs were obtained from try-net drags at depths shallower than 16 fathoms. Peak abundance occurred between 10 and 15 fathoms. Although large sea bobs were occasionally met within a moderate quantity, most catches of this species were small and consisted of individuals ranging in size from 100 to 500 shrimp per pound (heads on). Commercial quantities of sea bobs resulted from two drags with the 68-foot trawl. These two 13-fathom drags (Stations 203 and 208) each lasting approximately $1\frac{1}{2}$ hours, caught 120 and 80 pounds of heads-off sea bobs, respectively, ranging in size from 60 to 65 shrimp (heads off) per pound.

Try-net drags were also made off the coast of French Guiana and promising indications of brown shrimp were found in depths of 16 to 18 fathoms. Strong currents



Fig. 4 - Large catch of fish made northeast of the Surinam River by the Coquette.

were encountered in the area and, in some instances, they caused fouling of the try-net gear. Time was not available for production work with the 68- and 89-foot trawls.

Blue-colored shrimp, resembling the white shrimp (Penaeus setiferus) of the Atlantic and Gulf coasts of the United States, were taken at 4 stations off the Surinam and Coppename Rivers. In all instances the catch of that species (Penaeus schmitti) was less than 5 pounds. Penaeus setiferus is known to appear in a definite seasonal pattern and to migrate in concentrated schools. It is possible that

P. schmitti, its near-relative, may behave similarly, and thus be available in larger quantities along the Surinam coast at other times of the year.

Table 2 - Scientific and Common Names of Fish and Shrimp								
	Fish	Shrimp						
Scientific	Common	Scientific	Common					
Name	Name	Name	Name					
Micropogon sp.	Croaker	Penaeus brasiliensis						
Lonchurus sp.	11	Latreille	Pink-spotted					
Paralonchurus sp.	11	Penaeus aztecus Ives	Brown					
Family Ariidae	Sea Cat Fishes	Penaeus schmitti						
Nebris sp.	Surinam Butterfish	Burkenroad	-					
Cynoscion sp.	Sea Trout	Xiphopeneus kroyeri						
Macrodon sp.	11	(Heller)	Sea-bob					

Fish Catches: Trawling efforts with the 68-foot shrimp trawl, conducted north and northeast of the mouth of the Surinam River at depths of 12 to 14 fathoms, showed that substantial quantities of commercially-desirable species of fish could be taken consistently (fig. 4). Except for one instance, all drags in this area and depth range, made with the 68-foot shrimp trawl, caught from 330 to 840 pounds of commercially-desirable fish an hour; mainly sea trout, sea catfish, Surinam-butterfish, and croaker-like species (table 1). These catches also contained considerable quantities of fish which are not utilized commercially at present (fig. 5).

Although the catches were made in only one area, it has been reported that trawlers from other countries have been making good catches of commercial species of fish off the Coppename River. In addition, try-net catches of sea trout, croakers, and sea catfish indicate wide distribution of the fish throughout the intermediate zone. This portion of the work added considerably to the knowledge of the abundance and distribution of fish stocks initially gained during preliminary explorations by the Surinam Fisheries Department (F&WS 1954a).

SHELL RIDGE ZONE, 20 THROUGH 22 FATHOMS: As previously stated, no catches of commercial value resulted from trawl sets made on the shell ridge.

OFFSHORE ZONE, 23 THROUGH 40 FATHOMS: Excellent catches of especially large pink-spotted shrimp (10 to 25 shrimp per pounds, heads-off) were made in

extensive areas within the offshore zone by means of the 68- and 89-foot shrimp trawls. Most extensive coverage was obtained in the offshore area between the mouth of the Surinam River and the mouth of the Coppename River. During June, one full night of trawling $(9\frac{1}{2} \text{ hours})$ resulted in a total 366 pounds (heads-off) of pink-spotted shrimp averaging 10 to 15 shrimp per pound (heads-off); and a partial night of trawling (3 hours) yielded 180 pounds (heads off) of the same species. Based mainly on these successful June fishing efforts, an attempt was made to determine the maximum possible production from the same area in July. A total of 1,310 pounds of pink spotted shrimp (heads-off) averaging 15 to 25 per pound (heads-off) was taken in three successive nights of fishing. The average hourly catch rate for this period was 44 pounds. Two additional nights of trawling, which almost completely traversed the geographic limits mentioned above, yielded a total of 585 pounds (headsoff) of pink-spotted shrimp.

Trawling efforts in the offshore zone between the mouth of the Surinam River and the mouth of the Marone River were not extensive enough to provide ad-

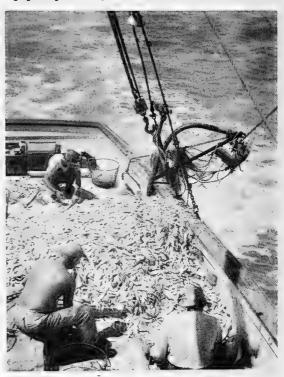


Fig. 5 - A 65-minute trawling catch estimated at 5,000 pounds. Commercially-valuable components included 150 pounds of brown shrimp and 910 pounds of fish.

equate information regarding the shrimp production potential. Excellent results, however, were obtained during one night of trawling. Trawling operations, in this instance, commenced off the mouth of the Surinam River and extended eastward. A total of 470 pounds of pink-spotted shrimp (heads off) was taken in 11 hours of fishing. During an additional night of trawling, farther east, a four-hour drag made in 30 to 35 fathoms caught 110 pounds of heads-off shrimp consisting of equal quantities of pink-spotted shrimp and brown shrimp. Both species averaged 15 to 25 shrimp per pound (heads-off). Considerable damage to the cod end of the net was caused by sawfish during one drag in this area; and the shrimp catch, therefore, was poor. These trawling results indicate that commercial quantities of marketable shrimp are widespread in the offshore zone.

WEATHER CONDITIONS

The Surinam trawling grounds lying beyond the 20-fathom contour are exposed to prevailing easterly winds for most of the year. Particularly during the winter season, winds of moderate to fresh velocity can be expected along with correspondingly increased sea conditions. There are no offshore reefs, islands, or shallow banks to provide a lee shore, and suitable inshore anchoring grounds are often ten hours away on a round-trip basis. There are, thus, problems associated with commercial-fishing operations that are somewhat different from those of the Gulf of Mexico and the South Atlantic coast of the United States.

During the winter months of January through March, the trade winds blow regularly and persistently from the northeast. However, the regularity of these trade winds provides a partial solution insofar as fishing efforts are concerned. Seas generated under these conditions may occasionally cause some crew discomfort, but trawling operations are feasible especially if trawling is carried out into the wind; i.e. in a northeasterly direction. Although the winter season is the period of heaviest weather, there is some compensation for this. Sudden damaging squalls (of the type encountered in Southeastern United States) are notably absent, at that time, on the Guianan Coast. In addition, the Guianas are singularly free from hurricanes which disrupt shrimping in other areas.

General consideration of the weather conditions of the area indicates that trawling can be carried out over an appreciable portion of the January to March period. With minor exceptions, such as summer tropical rain squalls, the remainder of the year is favorable for fishing. Because of the distance from the coast of the best shrimp grounds, and the absence of shelter, particular attention should be given to providing adequate ground tackle.

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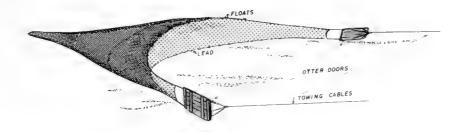
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Tobago, and British Guiana. AngloAmerican Caribbean Commission, pp. 19-20.



PRINTERS' INK FROM FISH

Pakistani fish technologists have produced printers' ink of good quality by mixing Puntis fish oil with linseed oil. Punti, <u>Barbus stigma</u>, (Puntius) is a fish which is abundantly available at allow price. <u>Shark-liver oil</u> is also used in the manufacture of black printers' ink. (<u>Australian Fisheries Newsletter</u>, February 1959.)



DEVELOPMENT OF STANDARDS FOR PACIFIC COAST FISHERY PRODUCTS

The development of voluntary standards for grades of fishery products was started about five years ago by the U. S. Department of the Interior's Fish and Wildlife Service. The first standard was published under an agreement with the U. S. Department of Agriculture in 1956. Standards for grades of fishery products were promulgated under this arrangement. Inspection and certification services for fishery products became the responsibility of the U. S. Department of the Interior on July 1, 1958. Since then the program has developed at an accelerating rate. Five standards have already been developed and put into effect by the Bureau of Commercial Fisheries: frozen fried fish sticks, frozen raw breaded shrimp, frozen fish blocks, frozen haddock fillets, and frozen halibut steaks. It is likely that by the end of 1959 this number may be doubled to include frozen raw breaded fish portions, frozen cod fillets, frozen ocean perch fillets, and frozen salmon steaks.

Some 28 firms are now under continuous inspection. On the Pacific coast one processor has accepted continuous inspection in the Los Angeles area and an inspector has been hired to service a Seattle processor as well as other processors in the Pacific Northwest that are interested in lot inspection.

The U. S. Department of the Interior's voluntary standards program consist of two major stages:

(a) Standards development and promulgation. (The development of the standard is carried on by the several technological laboratories, and when a given standard is judged to be reasonably satisfactory by industry and laboratory personnel, it is turned over to the Bureau's Washington office for review and re-working prior to official promulgation.)

(b) Product inspection and certification. (The inspection and certification is carried on by trained government inspectors.)

NEED AND OBJECTIVES: The need for, and the advantages of, voluntary U. S. standards for grades have been recognized by various segments of the fishery industry, and they have requested the Bureau of Commercial Fisheries to develop such standards.

The primary objective of this project is to develop and to assist in the promulgation of voluntary U. S. standards for grades which are to serve as a quality grading yardstick for buying and selling of fishery products; we thereby seek to create a quality-improving incentive, which has for its ultimate purpose a greater consumer acceptance and consumption of fishery products. A parallel objective is to train and work with the product inspection and certification groups (field inspectors) in developing practical means of evaluating, protecting, and improving the quality of fishery products. Active industry support and participation to these ends is essential.

The current work of the Bureau's Seattle Technological Laboratory on standards is concerned with:

- (a) Completing the standard for frozen salmon steaks.
- (b) Developing a standard for frozen dressed halibut.
- (c) Training and orientation of the newly-employed Government inspector at Seattle in the grading of frozen halibut steaks and all other fishery products that he may be called upon to inspect. (Inspection of fishery products may be on the basis of the published voluntary standards, Federal specifications, or such other applicable material, such as industry specifications).

As an example of some of the details involved in the development of a standard, the following sequence is given for the halibut steak standard which became official on March 15, 1959:

- (1) The responsibility for developing the Frozen Halibut Steak Standards was assigned to the Seattle Technological Laboratory.
- (2) The Standards Unit made numerous plant visits and discussed with various halibut steak processors the quality-affecting characteristics that should be considered.
- (3) Numerous samples from retail and wholesale origin were examined to see what other quality factors might be considered. In addition, some samples were allowed to spoil under accelerated storage conditions (simulating poor storage) to observe the development of the various deteriorative type of quality defects.
- (4) Quality factors that affect the desirability and eating quality of halibut steaks from the standpoint of the household consumer and fish buyers were investigated and considered.
- (5) When sufficient data were accumulated, a rough draft standard was drawn up and reviewed by our laboratory personnel from which was prepared a first proposed draft for industry consideration.
- (6) A public meeting was held with the various local segments of the halibut industry to discuss this first proposed draft. Industry comments and suggestions were embodied in a revised draft.
- (7) This revised draft was reviewed with the industry's appointed Halibut Steak Technical Committee in order to assure that the standards were practical and reflected quality levels that are reasonably attainable by industry. Based upon industry suggestions and further cross-consultation, the standards may be revised several times at this phase of the development, which was the case for the halibut steak standards. In addition, during this phase of development, the standards were reviewed by our other Bureau laboratories.
- (8) To test the practicality of the standards, a grading survey was made of some 300 randomly-selected retail and institutional size packages of frozen halibut steaks.
- (9) When the standards were considered close to what industry and the Technological Laboratory personnel considered reasonable, the latest revised draft was circulated, on a national basis, to the various segments of industry for comment. At this time industry was advised that a series of public hearings would be held in various major cities to further review the proposed standards.

- (10) On the basis of the comments and views expressed at these meetings, a final draft was prepared and submitted to the Washington office for approval. After minor modification it was submitted as a notice of proposed rule making, published in the Federal Register on December 3, 1958. Notice was therein given of the intention of the Director of the Bureau of Commercial Fisheries to recommend to the Secretary of the Interior, the adoption of the United States Standards for Grades of Frozen Halibut Steaks as set forth. Interested persons were given until January 1, 1959, to submit views or comments concerning the standard. No comments were received.
- (11) Accordingly, the standards as set forth were adopted, and published in the Federal Register of February 25, 1959. They became effective on March 15, 1959. (Federal agencies may now, if they wish, purchase frozen halibut steaks on the basis of the grades set forth in these standards.)

Although the standards are designed to reflect high product quality, they should, at the same time, be practical, keeping inspection costs to a minimum. For example, one of the quality factors considered in our preliminary drafts was free drip, the liquor that exudes from the fish meat on thawing. Based on laboratory tests, it was found that the time and cost-consuming procedure of making drip determinations was unessential and not too meaningful for halibut steaks. The deletion of drip simplified the halibut standards from the standpoint of equipment, time, and cost.



COD-LIVER OIL IS POTENT CHOLESTEROL LOWERER

In contrast to animal fats which increase the serum cholesterol level in the body, oil from marine animals--seals, sardines, whales--seems to lower the level.

Since cholesterol is believed to be associated with atherosclerosis, research reported on the potent cholesterol level reducing activity of cod-liver oil may be important in human medicine. It is more potent than some vegetable fats tested.

Rats fed a diet of starch to which cholesterol and coconut oil were added received both corn oil and cod-liver oil as dietary fats. The fish oil, report A. P. de Groot of the Central Institute for Nutrition and Food Research, Utrecht, and S. A. Reed of the Marfleet Refining Co., Ltd., Hull, had a higher cholesterol-lowering activity.

The fatty acid fraction accounts for most if not all of the activity, the scientists report in <u>Nature</u> (April 25, 1959).



Alaska

BIOLOGISTS PRODUCE LARGE RUN OF YOUNG RED SALMON IN RESEARCH LAKE: A very high survival of red or sockeye salmon fry planted in a study lake was achieved by Alaska Department of Fish and Game biologists at the Kitoi Bay Research Station on Afognak Island, the Commissioner of Fish and Game stated on July 6, 1959.

The Commissioner cited two reasons for this successful lake stocking. First, the lake had previously been cleared of



scrap fish, eliminating both predation and competition; secondly, a falls at the lake outlet had barred re-entry of scrapfish into the lake.

Whereas the usual fingerling survival in runs from natural lakes to the ocean is only about one percent, the spring migration count recorded survival at the Kitoi project of over 35 percent. Over 41,000 fingerling were counted from the 35-acre lake to the ocean.

While it is gratifying to obtain these excellent results and to establish a new run of salmon in a small lake that was previously barren, the knowledge gained will be of great importance in re-establishing some of the runs that have been depleted in large Alaskan lakes, the Commissioner said.

* * * * *

KING SALMON SPORT FISHERIES
IN SOUTHEASTERN ALASKA TO BE
STUDIED: A new research study on king
salmon stocks of the Southeast Alaskan

sport fisheries has been started, the Alaska Commissioner of Fish and Game stated on July 15, 1959.

This highly prized salt-water sport fish has shown signs of decline in various areas of the Pacific Coast and as a result a coastwise study has been called for, under the sponsorship of the Pacific Marine Fisheries Commission, which is an organization of representatives from state fisheries agencies.

In cooperation with the Commission's proposal, the Alaska Fish and Game Department is seeking to determine how many king salmon are being taken in the recreational fisheries and the location of the home streams of the various races.

It is known that king salmon taken in Alaskan waters come from rivers far to the south as well as from local streams, the Commissioner stated. It is necessary to have information on how many fish from each race are being harvested, in order to do an effective job of regulation.

It is expected that the new study will be financed in part from Federal Aid Dingell-Johnson funds.

* * * * *

RECORD NUMBER OF TAKU RIVER KING SALMON CAPTURED BY FISH WHEEL: Approximately 1,700 king salmon had been captured by June 16, 1959, by means of a fish wheel and 1,600 tagged by the Alaska Department of Fish and Game biologists at the Department's Canyon Island Research Station on the Taku River. This is almost three times as many as ever taken in a previous season.

In the nine years that the fish wheel has been in operation by the Department, 600 king salmon is the largest number ever taken in one season. This indication of a good escapement, plus general-

ly good fishing by the gillnetters on Taku Inlet, is an encouraging step in the maintenance of an adequate run of kings in the Taku River system.

Alaska research biologists are undertaking the tagging operation on the king salmon at the station, supplemented by a spawning ground survey on the upper Taku tributaries. This work will help determine several phases of the life history of the king salmon. An estimate of total escapement will be made. Scale samples, along with body measurements and sex ratios taken from the gill-net fishery, the fish wheel, and the spawning grounds will enable the biologists to ascertain the age and size composition of the run. (Alaska Department of Fish and Game news release, June 16.)



California

AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING CONTINUED: Airplane Spotting Flight 59-9-Crab: Coastal waters from Monterey to the California-Oregon border were surveyed from the air (May 15-16, 1959) by the Department's Cessna 180 to determine the fishing localities and relative fishing intensity of the central and northern California crab fleet. Excellent visibility and flying conditions prevailed and all crab fishing areas within the survey area were adequately scouted.

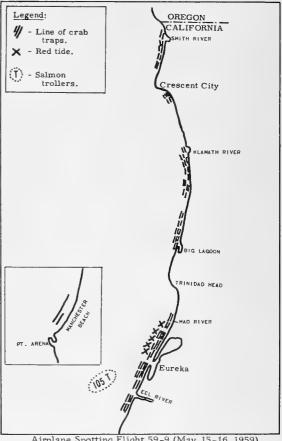
A total of 74 lines of crab gear were counted in the area bounded by False Cape and the Oregon border. This was a notable increase over the March and April counts for the same area. This increase is attributed to improved visibility and the use by fishermen of fewer units of gear per trap line to facilitate fishing operations in shallow depths. Concentrations of gear were found in the area between the Klamath River and Big Lagoon. as well as between the Mad and Eel Rivers.

Two lines of crab gear were noted between False Cape and Pt. Arena. These were set in moderate depths off Manchester Beach.

A total of 26 lines of crab gear was observed in the area between the Russian River and Half Moon Bay. The majority was set in moderate depths between San Francisco and Pt. San Pedro.

One line of gear was sighted off Moss Landing in Monterey Bay.

Pelagic fish schools varying in size from small to large were observed between San Francisco and Pt. San Pedro and in Monterey Bay. They were identified as anchovies. A partial census in Monterey Bay revealed 91 schools in the area between the Pajaro River and Monterey and 2 to 3 miles offshore.



Airplane Spotting Flight 59-9 (May 15-16, 1959).

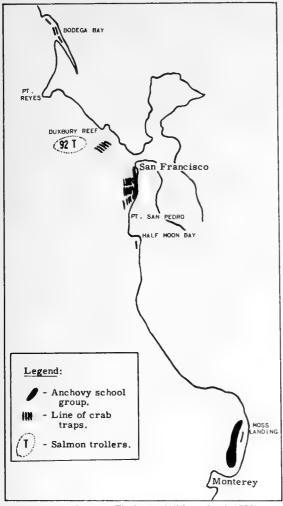
Red-tide conditions were present in the limited area from Eureka north to the Mad River.

Salmon trollers were concentrated 5 to 10 miles off the Eel River on the north coast and off Duxbury Reef in central California. Respective counts were 105 and 92 for the two areas.

Airplane Spotting Flight 59-10-Abalone: The shore line from Ano Nuevo to Ft. Bragg was surveyed (May 24, 1959) by the Department's Cessna 180 to estimate the number of abalone fishermen during a very low minus tide falling on a weekend.

Favorable conditions prevailed both for observation and for the abalone fishermen. Because of optimum conditions more people were observed on the beaches than on any previous aerial count. In most areas crowds were too dense for individuals to be counted. Only estimates could be made and at some locations only the automobiles could be counted with any degree of accuracy.

It is difficult from the air to determine exactly what animals are being taken by people in and among the rocks. In some locations, such as Bolinas Lagoon, it was obvious that the people were digging for clams; in others, they were fishing from rocks but the majority of fishermen appeared to be searching for abalone.



Airplane Spotting Flight 59-9 (May 15-16, 1959).

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BARRACUDA AND WHITE SEA BASS SURVEY OFF BAJA CALIFORNIA AND SOUTHERN CALIFORNIA CALIFORNIA CALIFORNIA CALIFORNIA CALIFORNIA CONTINUED (M/V N. B. Scofield Cruise 59S3-Barracuda-White Sea Bass): The coastal waters off Baja California and southern California from Pta. Canoas north to Santa Catalina Island were surveyed (May 6-24, 1959) by the California Department of Fish and Game research vessel N. B. Scofield to tag and release barracuda and white sea bass, and to make incidental fish collections.

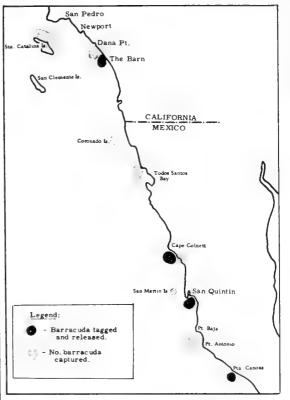
In all, 2,450 barracuda ranging in length from 450 to 1,003 mm, were tagged with spaghetti loop tags and released--2,300 in Mexican waters and 150 off southern California. No white sea bass were caught.

Barracuda were captured, tagged, and released on 12 of 17 fishing days in five areas. The largest catches were made where surface water temperatures ranged between 15° C. (59° F.). Thirteen fish were released at Pta. Canoas, 591 in the vicinity of Hondo Canyon, 375 off Camalu Point, 1,282 in Colnett Bay, and 150 off "The Barn" between Oceanside and San Clemente.

Fishing at the Coronados Islands, San Carlos Bay, Geronimo Island, Point Baja, Todos Santos Bay, San Martin Island, San Catalina Island, San Mateo Point, and Dana Point failed to produce barracuda.

Schools of barracuda were located by trolling four lines through areas where the fish were most likely to be. The lines, attached to outriggers, were set to fish at various depths with several types of bone and metal lures.

After locating barracuda, they were captured either by still-fishing or pole-trolling-using 18-foot bamboo jack-poles. For still-fishing, a small feather lure was attached to a wire leader and moved back and forth at the surface along the side of the boat. When pole-trolling, the same pole was used but a metal or bone lure was employed in place of the feather. The pole was held by hand from the stern of the vessel which moved at a speed of two to four knots. The means of capture depended upon the behavior of the fish. When a great number of barracuda could be lured to the boat by chumming with live bait, they were still-fished. When the fish were scattered, a condition apparently associated with the presence of large



M/V \underline{N} , \underline{B} , Scofield Cruise 59\$3-Barracuda-White Sea Bass (May 6-24, 1959).

amounts of natural food in the water, the poletrolling method was used.

As the fish were captured, they were placed in the vessel's live bait wells and held until fishing slowed down or stopped completely or until the wells were filled to capacity. The largest of the three bait wells has a capacity of 3,000 gallons and held almost 300 barracuda. The two smaller wells, each with a capacity of about 2,500 gallons, held between 200 and 250 barracuda. Morality in the tanks was between 1 and 1.5 percent. During the early part of the cruise, only the 3,000-gallon tank was available, but as the live bait was used up, the two smaller wells were freed for use as holding tanks.

The advantages of holding the fish rather than tagging them as they were caught were: (1) no fishing time was lost while waiting for the fish to be tagged; (2) the fish could be handled more carefully at all stages; (3) weak fish died in the tanks; and (4) the chance that the tagged fish would pull the rest of the school away from the boat was eliminated. Tagging was usually done in a different location from where the fish were caught—either on the way to the night anchorage or at the anchorage.

Two teams were used during the tagging operations, including two taggers, two fish holders, one recorder, and one man for brailing the fish from the tanks. The time required to tag each fish was approximately 20 seconds.

Besides barracuda, 11 other species of fish were collected during the cruise.

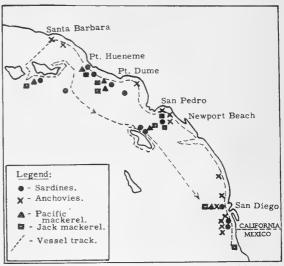
Note: Also see Commercial Fisheries Review, March 1959, p. 29.

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PELAGIC FISH POPULATION SURVEY OFF COAST OF SOUTHERN AND CENTRAL CALIFORNIA CONTINUED: M/V "Alaska" Cruise 59A4-Pelagic Fish: The coastal and island waters of southern California from Santa Barbara southward to the Coronado Islands were surveyed (April 28-May 18, 1959) by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to sample the spring spawning sardine population off southern California; (2) to sample sardines, Pacific mackerel, jack mackerel, and anchovies for determining distribution and relative abundance; and (3) to collect live sardines for genetic studies being conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla.

A total of 88 light stations were occupied. Sardines were taken at 12, anchovies at 13, jack mackerel at 9, and Pacific mackerel at 6.

A total of 120 pelagic fish schools were sighted in 386 miles of scouting--33 of these were identified as sardines, 13 as anchovy, 46 as Pacific mackerel, and 28 were unidentified. Adult sardines were sampled from San Pedro to Point Mugu and in the vicinity of the Channel Islands. These fish averaged 197 mm. long and were frequently schooled with small jack mackerel and Pacific mackerel. Small sardines were sampled from the Mexican border northward to La Jolla. These fish ranging from 130 to 160 mm., were schooled with



M/V Alaska Cruise 59A4-Pelagic Fish (April 28-May 18, 1959).

anchovies. Sardine and Pacific mackerel schools were observed most frequently in the Channel Island area.

Almost all of the adult sardines sampled were in advanced stages of sexual maturity while only a very few of the small individuals showed sexual development. The adult sardines were difficult to sample due to the great depth at which they remained when attracted to the light. Lures were the only effective means of sampling.

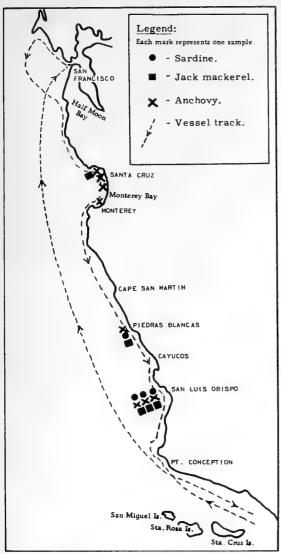
Live sardines taken at Santa Catalina Island were delivered to the Bureau's laboratory at La Jolla.

Sea surface temperatures ranged from 11.6°C. (52.9°F.) at Santa Barbara to 19.2°C. (66.6°F.) near San Pedro. The low temperature was taken following three days of gale-force winds. Red crabs (Pleuroncodes planipes) were present at light stations as far north as the northern Channel Islands.

M/V "Alaska" Cruise 59A5-Pelagic Fish: The coastal waters off central California, from Pt. Reyes southward to Pt. Conception, were surveyed (May 28-June 15, 1959) by the Department's research vessel Alaska to sample the sardine spawning population off central California; to sample sardines, Pacific mackerel, jack mackerel, and anchovies for determining their distribution and relative abundance; and to collect live sardines for genetic studies being conducted by the U.S. Bureau of Commercial Fisheries at La Jolla.

A total of 46 night light stations was occupied. Ten of the stations (22 percent) yielded one or more of the four pelagic species (sardines, Pacific mackerel, jack mackerel and anchovies). Anchovies were sampled at 9 stations (20 percent), jack mackerel at 5 (11 percent), and sardines at 4 (9 percent).

Three of the four sardine samples originated in San Luis Obispo Bay and one in San Simeon Bay.



M/V Alaska Cruise 59A5 (May 28-June 15, 1959).

The sardines ranged in standard length from 168-216 mm., with an average length of 204 mm. Almost all of the female sardines examined were in early stages of egg development but none was in a spawning condition.

A total of 252 miles was scouted at night and 308 fish schools were observed. Of these, 282 were identified as anchovies, 5 as sardines, and the remainder (21) were unidentified. Fish schools were concentrated in two general areas—in Monterey Bay and off Pt. Buchon. Off Pt. Buchon they were so numerous that 61 schools of anchovies and 2 of sardines were counted between 0400 and 0430 on May 30. A dark night and bright bioluminescence made visual scouting conditions excellent at that time.

Live anchovies and jack mackerel obtained in Long Beach Harbor were delivered to the Steinhart Aquarium at San Francisco for use in experimental studies.

Airplane Spotting Flight 59-8-Pelagic Fish: The inshore area of California between La Jolla and Ano Nuevo Point was surveyed from the air (May 11-13, 1959) by the Department's Cessna 170 (1359 D) to assess the distribution and abundance of pelagic fish schools.

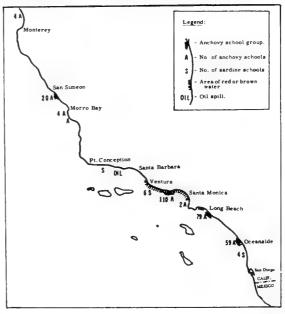
Weather conditions north of Santa Monica Bay were unfavorable for the third consecutive month, but south of Santa Monica Bay conditions were good.

Pelagic fish were again scarce north of Point Conception and only 29 anchovy schools were observed. Four small schools were present one mile off Moss Landing, 20 large dense schools one to two miles off Cambria Pines, four small schools just north of Point Buchon near the surf line, and one small school at Pecho Rock near Avila.

A total of 11 sardine schools and 250 anchovy schools were counted south of Point Conception. One sardine school was present two miles south of Gaviota, six were one to two miles offshore at Point Mugu, and the remaining four were about three miles west of Encinitas.

A large concentration of 'breezing" anchovies was seen near Point Dume. A total of 110 schools were counted and it was apparent many more were in the area. The late hour (1800 P. D. T.) and the limited offshore range of the airplane made it impossible to accurately determine the extent and magnitude of the group.

Between Seal Beach and Huntington Beach, 79 dispersed schools of anchovies were counted. As usual, the fish in this area were in a narrow band extending from the surf line to about one-quarter mile offshore. A small group of 59 schools was



Airplane Spotting Flight 59-8 (May 11, 12, and 13, 1959).

present close to shore between the Santa Margarita River and Oceanside.

Dirty water was prevalent in the southern portion of the State, with several outbreaks of redtide. From Ventura to Santa Monica the inshore water was extremely dirty ranging in color from yellow to brown to deep red. In the vicinity of Point Mugu the organisms responsible for the red water had converged into drifts or "windrows" aligned parallel to the shore. Minor occurrences of red tide were also seen off Cambria Pines, in Los Angeles Harbor and near Oceanside.

One large oil spill was seen near Elwood. Although this is one of the natural oil seepage areas, the large slick in question originated at the buoys and pipeline off the Elwood pumping station.

Airplane Spotting Flight 59-11-Pelagic Fish: The inshore area between the Mexican Border and Pigeon Point was surveyed (June 2-4, 1959) by the Department's Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

A heavy overcast hampered observations in the Monterey area, but during periods of clearing adequate coverage was achieved.

For the first time this year, fish schools were seen in Monterey Bay. Most of the schools were anchovies, but four sardine schools were also seen. All but six of these were between Santa Cruz and the Salinas River. They were seen as far offshore as three miles and in very shallow water near the beach. During two afternoons of scouting, only 141 schools were counted. This was but a small frac-

Monterey

2A
A Morro Bay
9 S
6A
2A

Pt. Arguello

Santa Barbara

Santa Monica

Long Beach
24 A

24 A

Ceanside
group.
A No. of anchovy schools.
S - No. of sardine schools.

28 A

CALIF, MEXICO

Airplane Spotting Flight 59-11 (June 2-4, 1959).

tion of the more than 2,000 present in the Monterey area one year ago. The four sardine schools were small and tight and were noted about one mile off-shore between the Pajaro River and Moss Landing.

Between Morro Rock and Cayucos three large anchovy schools were seen and eight similar schools were counted between Pismo Beach and Avila. Four large and five small sardine schools were found one mile off Point San Luis.

Although reports from fishermen and others indicate the presence of large numbers of anchovies in Santa Monica Bay, no schools were seen during this flight.

A total of 24 anchovy schools was present in Los Angeles Harbor and as has been the case all year, anchovies were plentiful close to shore between Seal Beach and Newport Beach. Four sardine schools were seen two miles off the Huntington Beach pier.

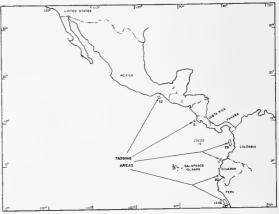
Twenty-eight large anchovy schools were found close to shore between San Diego and the international boundary.

Several spots of red tide were noted in Los Angeles-Long Beach Harbor and three days after the survey an intense outbreak of red water occurred along the beach at Long Beach and Belmont Shore.

Note: Also see Commercial Fisheries Review, July 1959, p. 25, and Aug. 1959, p. 18.

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TUNA TAGGED BETWEEN SOUTHERN MEXICO AND PERU (M/V Constitution Cruise 59C1-Tuna): A total of 1,569 tuna were tagged during a March 5-May 23, 1959, cruise to the Central and South American tuna fishing grounds by California Department of Fish and Game biologists aboard the commercial tuna clipper Constitution. The tagging operations were part of continuing population, growth, and migration studies. In addition, a comparison was made between the type G spaghetti tag and a new type dart tag (type FT-2) as to ease in tagging and eventual recovery efficiency. Incidental oceanographic observations were made



M/V Constitution Tuna Tagging Cruise 59C1-Tuna (Mar. 5, 1959-May 23, 1959).

Table 1 - Number of Tuna Tagged by Type of Tag and Area of Release										
Locality	(Yello Secure	Spaghetti ow) X-270 d with a K	-I	Type FT-2 (Yellow) Dart Tag						
	Yellowfin Tuna	Skipjack	Total	Yellowfin Tuna	Skipjack	Total				
Tehuantepec	11	0	11	11	0	11				
Central America	22	4	26	24	1	25				
Panama	11	2	13	12	1	13				
Ecuador	1	2	3	2	2	4				
Guayaquil Gulf	3	7	10	3	7	10				
Peru (north)	1	695	696	5	742	747				
Total	49	710	759	57	753	810				

and marine organisms were collected from 34 livebait hauls.

During the tagging operations, yellowfin tuna were measured to the nearest $\frac{1}{2}$ centimeter, but skipjack were not measured. The dart tag was found to be much easier and faster to use than the type G tag.

Sea surface temperatures were recorded at all fishing and baiting areas. There was no obvious relationship between surface temperatures at the fishing grounds and the catches of tuna (74.1° F.-86.5° F.). Surface temperatures at the baiting areas ranged between 65.5° F. and 77.3° F.



Canned Fish

CONSUMER PURCHASES, MAY 1959: Canned tuna purchases by household consumers in May 1959 were 919,000 cases of which 42,000 cases were imported. By type of pack, domestic-packed tuna purchases were 221,000 cases solid, 556,000 cases chunk, and 100,000 cases grated or flakes. The average



purchase was 1.9 cans at a time. About 30.0 percent of the households bought all types of canned tuna; only 1.7 percent bought the imported product. The average retail price paid for a 7-oz. can of domestic solid or fancy was 34.2 cents and for a $6\frac{1}{2}$ -oz. can of chunk 28.0 cents. Imported solid or fancy was bought at 30.3 cents a can. May purchases were higher than the 847,000 cases bought in April by 8.5 percent; retail prices in most cases were slightly lower.

During May, household consumer purchases of California sardines were 43,000 cases; and 32,000 cases imported sardines. The average purchase was 1.7 cans at a time for California sardines and 1.9 cans for imported. Only 1.6 percent of the households bought canned California sardines and 2.1 percent imported. The average retail price paid for a 1-lb. can of California sardines was 23.9 cents, and for a 4-oz. can of imported 26.0 cents. Retail prices were slightly higher for both California and imported canned sardines. Because of the liberal stocks of canned California sardines, there has been a steady increase in purchases since October 1958.

Canned salmon purchases in May 1959 were 223,000 standard cases, of which 114,000 cases were pinks and 52,000 cases reds. The average purchase was 1.2 cans at a time. About 14.9 percent of the households bought all types of canned salmon; 7.2 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 56.7 cents and for red 86.5 cents. May purchases were down about 2.2 percent from the 228,000 cases bought in April.



Cans--Shipments for Fishery Products, January-May 1959



Total shipments of metal cans for fishery products during January-May 1959 amounted to 43,034 short tons of steel (based on the amount of steel consumed in the

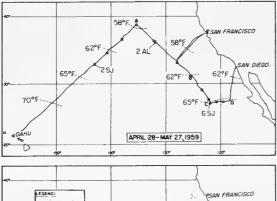
manufacture of cans) as compared with 37,809 tons in the same period a year ago. Canning of fishery products in January-May this year was confined largely to tuna, Gulf oysters, and shrimp. Shipments of metal cans for fishery products were up by 24.3 percent from April to May this year and higher by 65.0 percent from May 1958 to this May.

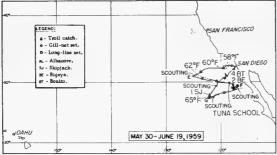
Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Central Pacific Fisheries Investigations $\frac{1}{2}$

ALBACORE TUNA MIGRATIONS IN NORTH PACIFIC STUDIED BY M/V

HUGH M. SMITH (C-52): Tracing the movements of albacore tuna in the North Pacific between Hawaii and southern California before the commercial fishing season started was the objective of the final cruise (April 28-June 19, 1959) of the research vessel Hugh M. Smith of the U. S. Bureau of Commercial Fisheries. The California Department of Fish and Game research vessel N. B. Scofield also cooperated in the study.





M/V Hugh M. Smith Cruise 52 (April 28-June 19, 1959).

In recent years it has been shown, through recovery of tagged fish, that the albacore migrate seasonally between Japanese and American waters. These commercially-important tuna leave American waters in the fall and spend the winter in Japanese waters, returning to Southern California waters during the spring months. The location and time of entry of the albacore into California waters are being sought.

The results of this joint cruise, with the \underline{N} . \underline{B} . Scofield indicate: (1) that there were no albacore in the primary portion

of the survey area (east of 125° W.), and (2) that the spring migration of albacore into the west coast occurred to the north of this primary survey area, where the N. B. Scofield of California caught a number of albacore on trolling gear.

A total of 26 stations were fished from the Hugh M. Smith during the cruise (gill net 13, long-line 9, and scouting 4) and resulted in the capture of 17 tuna. Two albacore and 3 skipjack were captured by trolling (8 lines). All except 1 skipjack were tagged with dart tags and released in good condition. A total of 6 skipjack were netted in the 10 shackles of gill net fished at each station. Two big-eyed were captured on the 20-basket, 12-hook longline gear especially adapted to fish at depths of 2, 4, 8, and 16 fathoms. Four bonito were captured in the gill net. In addition to tuna, 43 sharks were taken on the gill net and long-line gear. A school of tuna was sighted during the cruise but the species could not be identified.

Photometer stations (37) were occupied at noon of each day except during rough seas. Stations immediately following the gill-net sets were attempted, but were abandoned because of an insufficiency of sunlight. Secchi disc and Forel color measurements were made simultaneously with photometer readings. Carbon-14 samples (43) were usually taken coincident with the noon photometer readings and 8 additional stations were placed in the cruise area where conditions changed abruptly. Eighteen tows of C-14 samples were made for the University of Hawaii.

Surface plankton hauls were made each night with a 1-meter net except when the gill net (anchored to the vessel) was fished or seas were rough. Nightlight stations of 1-hour duration were made coincident with each gill-net set.

Bathythermograph (BT) casts were made every 6 hours when running and on all stations. On station both 900-ft. and 450-ft. or 200-ft. casts were made. Surface salinity samples were collected with each BT. Phosphate samples were collected and frozen on each station and every 90 miles along tracks between Oahu and 1250 W. Eastward of this longitude they were taken every 30 miles;

^{1/}These investigations prior to the August 1959 Commercial Fisheries Review were listed under Pacific Oceanic Fisheries Investigations.

that is, coincident with each BT cast. The thermograph was operated continuously during the cruise. Four weather observations were made and transmitted each day.

A number of the albacore caught during the cruises by the two vessels were tagged in the hope that their recovery would shed light on the development of concentrations in commercial quantities.

The Hugh M. Smith has been based at and operated by the Bureau's Biological Laboratory at Honolulu. For this cruise the vessel left Honolulu on April 28, but instead of returning to its home port it docked at San Diego, Calif., since it has been transferred to the Bureau's California area office. The vessel will be leased to the Scripps Institution of Oceanography, La Jolla, Calif., for oceanographic and marine biological research.

* * * * *

BEHAVIOR STUDIES OF SKIPJACK
TUNA TO BE MADE DURING HAWAIIAN SUMMER FISHERY: During June
1959, biologists of the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries were busy preparing for the behavior studies to be conducted during the period of the Hawaiian summer skipjack fishery. The program involves studies both from vessels at sea and of captive tuna held in tanks at the Honolulu Laboratory's docksite facilities.

The first behavior studies of skipjack in their natural environment and under actual fishing conditions were made from the M/V Charles H. Gilbert in 1956 by an observer equipped with an aqualung. In 1957, an overside "dry" chamber with observing ports was installed. Because of cavitation and resulting bubbles obscuring the underwater view from the ports of the "dry" chamber, a chamber was installed in the hull of the vessel. This installation, completed in late June, has been tested and found to be free from effects of cavitation. The chamber is sufficiently spacious for the observer to use various types of movie and still cameras for photographing the behavior of the fish during normal fishing operations and under experimental conditions.

TAGGING RETURNS INDICATE SKIP-JACK TUNA MIGRATE INTO HAWAIIAN WATERS FROM THE WEST: Skipjack tuna tagged in Hawaiian waters by biologists of the U.S. Bureau of Commercial Fisheries Central Pacific Fisheries Investigation continued to be recovered during June. One skipjack, released near the Hawaiian island of Kauai in May 1958, was recovered to the southeast of the nearby island of Lanai. The second recovery was a skipjack released in March 1959 south of the island of Niihau and was recovered to the east near Penguin Banks. These two recoveries of fish tagged and released from the M/V Hugh M. Smith are among the few instances of skipjack that were tagged outside of the fishery and later moved into the fishery. These results tend to support the evidence recently accumulated that the skipjack each spring move into the Hawaiian area from the west.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE CANNED SALMON REQUIREMENTS FOR FISCAL YEARS 1960 AND 1961: Anticipated requirements of canned salmon by the Military Subsistence Market Centers



of the U. S. Department of Defense for the use of the armed forces are as follows: fiscal year 1960 (July-June), 4,578,000 pounds; and fiscal year 1961, 3,135,000 pounds. All purchases for both fiscal years will be made between July and December.

Stocks of canned salmon on hand as of June 30, 1959, amounted to 1,338,000 pounds and estimated stocks on hand as of June 30, 1960, will be about 1,942,000 pounds.

* * * * *

DEPARTMENT OF DEFENSE PUR-CHASES, JANUARY-JUNE 1959: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.2 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in June 1959 by the Military Subsistence Market Centers. This exceeded the quantity purchased in May by 10.8 percent, but was 3.2 percent under the amount purchased in June 1958. The value of the purchases in June 1959 was higher by 13.0 percent as compared with May, but was down 10.4 percent from June 1958.

-	Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, June 1959 with Comparisons									
-	OUANTITY VALUE									
	Jur	ne	Jan.	Ju	ne	Jan.	-June			
	1959	1958	1959	1958	1959	1958	1959	1958		

. . . . (1,000 Lbs.) (\$1,000). 2,212 | 2,285 | 11,346 | 11,595 | 1,170 | 1,306 | 5,987 | 6,600

Prices paid for fresh and frozen fishery products by the Department of Defense in June 1959 averaged 52.9 cents a pound, 1.1 cents more than the 51.8 cents paid in May, but 4.3 cents less than 57.2 cents paid during June 1959.

Canned Fishery Products: Sardines were the principal canned fishery product purchased for the use of the Armed Forces during June. During January-

Table 2 - Canned Fishery Products Purchased by Military										
Subsister	Subsistence Market Centers, June 1959 with Comparisons									
	QUANTITY VALUE									
Product	Ju	ne	Jan	June	Jur	ie .	JanJune			
1	1959	1958	1959	1958	1959	1958	1959	1958		
	(1,000 Lbs.)					(\$1,000)				
Tuna	- !	513	1,832	1,783	-	250	868	890		
Salmon	5	73	12	1,400	4	44	9	768		
Sardine	160	9	669	42	28	3	100	15		

June 1959 purchases of the three principal canned fishery products were lower by 22.1 percent from the purchases made from January-June 1958. Purchases of canned tuna were up by 2.7 percent and about 15.0 percent for sardines, but canned salmon purchases were down sharply from the same period in 1958.

Note: Armed Forces installations generally make some local purchases not included in the data given, actual total purchases are higher than indicated, because it is not possible to obtain local purchases.



Fisheries Loan Fund

LOANS APPROVED THROUGH
JUNE 30, 1959: As of June 30, 1959, a
total of 587 applications for fisheries
loans totaling \$18,902,173 had been received. Of these, 317 (\$7,713,233) have
been approved, 213 (\$5,780,484) have
been declined or found ineligible, 42
(\$1,678,906) have been withdrawn, and
26 (\$3,101,534) are pending. Several of
the pending cases have been deferred indefinitely at the request of the applicants.
Sufficient funds are available to process
new applications when received.

The following loans have been approved; between April 1 and June 30, 1959.

New England Area: Alexis Fagonde, Jr., Beals, Me., \$3,000; Murray Pinkham, Boothbay Harbor, Me., \$4,000; Frederick P. Elwell, St. George, Me., \$2,000; Elizabeth N. Corporation, Fairhaven, Mass., \$36,830; Tripolina Bramamte, Medford, Mass., \$35,000; C & F Fishing Corporation, New Bedford, Mass., \$46,000; George P. Berry, Port Norris, N. J. \$15,000.

South Atlantic and Gulf Area: Milton A. Danberg, Key West, Fla., \$10,000; Sidney J. Clopton, Pensacola, Fla., \$14,800; W. D. Coons & A. E. Moorer, Mt. Pleasant, S. C., \$17,000.

California: Wm. Howard Day, San Diego, \$19,950; Wm. G. Huston, San Diego, \$7,000; Salvatore Tarantino, San Francisco, \$2,500.

Pacific Northwest Area: Kenneth E. Staffenson, Agate Beach, Oreg., \$3,500; Clayton C. Howe, Anacortes, Wash., \$2,000; Ernest R. Soeneke, Neah Bay, Wash., \$20,000; Alex C. Prankard, Olympia, Wash., \$6,232; Axel & Perry Buholm, Seattle, Wash., \$14,000; Earl E. McCarthy, Seattle, Wash., \$29,600; Ora L. Olson, Snohomish, Wash., \$29,524.

Alaska: Douglas R. Freed, Elfin Cove, \$2,500; Edward K. Haffner, Juneau, \$5,600; Sig Dale, Ketchikan, \$3,305; Victor Edenso, Ketchikan, \$6,000; Arne Iverson, Ketchikan, \$10,500.

<u>Hawaii</u>: Sea Queen Fishing Co., Honolulu, \$20,000.

Fishing Vessel and Gear Developments 1/2

EQUIPMENT NOTE NO. 1--NEW ALL-ALUMINUM SALMON GILL-NET BOATS BUILT FOR ALASKA FISHERY: Ten all-aluminum gill-net vessels for use in the salmon gill-net fishery of Cook Inlet, Alaska, have been designed and constructed recently by a Seattle, Wash., company. The vessels measure 32 feet in over-all length, 11 feet 6 inches in beam, and have a 31-inch draft. They have a displacement of approximately 9,200 pounds and a fish-hold capacity of approximately 27,000 pounds.

a throttle and hydraulic clutch control, one at the pilothouse and one in the fishing cockpit. The pilothouse control is arranged so that it may be operated from inside the house or from the main deck immediately abaft the house.

The galvanized steel fuel tank of 140-gallon capacity is installed under the fishing cockpit, and a 15-gallon fresh-water tank and an 8-gallon aluminum stove-oil tank are mounted in the house top. All piping consists of nylon tubing.

The forecastle contains 2 bunks, an oil stove for cooking, and a stainless steel sink measuring 10 by 12 inches.



Fig. 1 - Two of the ten all-aluminum gill-net boats recently designed and constructed for the Cook Inlet salmon fishery.

The hull is an all-welded structure of $\frac{3}{16}$ -inch aluminum plate with longitudinal framing. Use of outside framing on the bottom facilitates efficient unloading and cleaning of the fish hold. Integral aluminum buoyancy tanks, capable of keeping the vessel afloat when swamped, are built into the bow and stern sections. The house is of combination welded and riveted $\frac{1}{8}$ - and $\frac{3}{16}$ -inch plate. This weathertight construction eliminates the leakage problem common to wooden houses.

Each vessel is powered with a 165 horsepower gasoline engine used with a 2:1 hydraulic reduction gear to provide a speed of 15 knots--an increase of 7 or 8 knots over the speed of most conventional gill-net boats. Two engine control stations are provided, each consisting of

The increased spaciousness of this area affords much better accommodations than has been customary on conventional boats in the gill-net fishery.

The 10 vessels are equipped with gillnet reels measuring 5 feet in diameter and can be adapted readily for methods of gill-net hauling involving the following equipment: hydraulically-driven stern rollers; hydraulically-driven gill-net reels; or davit mounted, hydraulicallydriven, Puretic power blocks.

Use of lightweight aluminum for small-boat construction has many advantages. It tends toward low maintenance costs because the cabin and hull require no paint or caulking and because corrosion and dry rot are not problems. In addition, opments or improvements in gear, vessels, and related sub-

This article is the first of a series concerned with new developments or improvements in gear, vessels, and related subjects that will be published under the heading "Fishing Gear and Equipment Developments."

aluminum construction permits greater freeboard, 50 percent greater fish capacity, and higher speeds than conventional designs of the same size. Bacteria and odors cannot penetrate the hold, and consequently better quality fish are assured.

Construction of the all-aluminum gillnet boats follows the successful employment of aluminum purse-seine boats in the Atlantic Coast menhaden fishery.

--By Fred Wathne, Fishery Methods & Equipment Specialist Branch of Exploratory Fishing & Gear Research Division of Industrial Research & Services Seattle, Wash.



Frozen Food

PROPOSED HANDLING CODE: At the annual meeting of the Association of Food and Drug Officials of the United States (AFDOUS), held in Boston, Mass., a proposed handling code for the Frozen Food Industry was presented. The code involves (1) Retail Refrigeration Equipment and (2) Refrigeration Equipment for Freezing, Storage and Transportation of Frozen Foods. Each of these sections of the over-all code, as read at the meeting, calls for frozen foods to be maintained at 0° F. or lower at all times. The responsibility for compliance would rest with the processor of the product. Receivers at warehouses, for transportation firms, and for retail establishments would not be permitted to accept shipments if the internal temperature exceeded 0° F. U.S. Bureau of Commercial Fisheries and industry advisors serving on the subcommittees which wrote the code realize that present refrigeration equipment, especially in the retail and transportation industries, cannot immediately meet the 00 F. requirement. Therefore, an administrative tolerance was established in the temperature requirements and also in the time needed to fully comply with the code.

The adoption of this Frozen Food Handling Code by AFDOUS, of course, does not automatically make it mandatory. However, it is intended as a strong recommendation to state and municipal legislative bodies and regulatory agencies in writing their local laws. A prime purpose of AFDOUS is to foster uniformity in food and drug laws in the several states. It is predicted that quite a number of states will very soon be considering laws or administrative regulations based on the AFDOUS Code.



Great Lakes

PICKEREL FLUCTUATIONS BEING STUDIED: The serious problem of drastic fluctuations in the occurrence of pickerel and other important Great Lakes fish is being studied by biologists of the U.S. Bureau of Commercial Fisheries in cooperation with the fish and wildlife agencies of the States bordering the Lakes. At the present time there is no evidence to support the view that commercial fishermen have caused the decline of pickerel in Lake Erie. The studies thus far show that the important species of fish in Lake Erie, including the pickerel, fluctuate naturally because of uncertainties in the Lake itself.

At times a complete loss of the reproduction of the important species leaves a dearth of the fish in the Lake for a period of years. Sometimes these same conditions which cause drastic declines in the abundance of one species act favorably upon the reproductive processes of other species and the result is that there is a natural waxing and waning of many of the fish populations in Lake Erie. Studies on Lake Erie over the past 50 years have shown substantially the same picture. These fluctuations in abundance appear to be caused by the shallow nature of Lake Erie and its position with respect to the prevailing winds which affect the temperature and lake stratification in both summer and winter.

Even though there is no evidence that the commercial fisheries of Canada or of the United States have affected these valuable sport fisheries, the International Great Lakes Fishery Commission is now studying this problem.

* * * * *

SEA LAMPREY CONTROL STUD-IES: To save lake trout and other fish from the predatory sea lamprey and, therefore, preserve the livelihood of many fishermen, the U.S. Bureau of Commercial Fisheries, the Great Lakes States, and Canada conduct research and test control measures against sea lampreys. Success in developing and testing selective toxicants that destroy lamprey larvae without significantly harming fish and other aquatic organisms made possible full-scale chemical control operations in streams tributary to the south shore of Lake Superior throughout fiscal 1959. By the end of the year the toxicant had been successfully applied to half of the United States tributaries that will require treatment.

Electrical barriers are still operated on Lake Superior to prevent lamprey reinfestation of treated tributaries and to provide a measure of results from chemical control. The lamprey research and control program is carried out under contract with the Great Lakes Fisheries Commission, established by treaty with Canda in 1956.



Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY FISHING IN LAKE
ERIE CONTINUED (M/V Active Cruise
2): To obtain information on the seasonal distribution and commercial availability of smelt and other fish stocks in west central Lake Erie between Sandusky and Cleveland, Ohio, surface-scouting and echo-sounding operations were conducted on a 15-day (June 2-24) exploratory cruise by the U. S. Bureau of Commercial Fisheries chartered vessel Active.

Forty-five tows were completed, using a standard 50-foot two-seam balloon trash-fish trawl, with a $1\frac{1}{4}$ -inch mesh bag. Gear damage to trawls was light. Due to the absence of surface schools of fish, no seine fishing was tried.

Commercial concentrations of smelt were found over the area from Huron to

Cleveland, at depths greater than 7 fathoms. The best catches were made northeast of Lorain, where up to 500 pounds of smelt, 12 to 18 to the pound, were taken per half-hour tow. Trawl tows near Cleveland produced mixed catches up to 100 pounds of yellow perch, sheepshead, white bass, and smaller smelt, averaging 35 to 40 to the pound.



M/V Active Cruise 2 (June 2-24, 1959).

With few exceptions, at depths beyond 10 fathoms, smelt were found at midwater levels above the reach of bottom-trawl gear. With the approach of seasonal stratification of the lake, smelt have, in the past, tended to remain within the thermocline or in areas where bottom temperatures are considerably below surface temperatures. Surface temperatures ranged from 66° F. to 75° F. Bottom temperatures ranged from 60° F. at 5 fathoms to 44° F. at 13 fathoms.

The cruise was interrupted June 8 to 12 to demonstrate trawling operations to interested commercial fishermen at Sandusky, Huron, Vermilion, and Lorain, Ohio.

The M/V Active was scheduled to leave Sandusky, Ohio, about July 6, on a third 15-day exploratory fishing and gear research cruise. The area of operations was to be Cleveland to Conneaut, Ohio.

Note: Also see Commercial Fisheries Review, June 1959, p. 36.



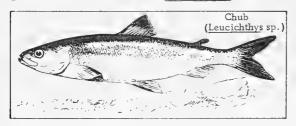
Great Lakes Fishery Investigations

SURVEY OF SOUTHEASTERN LAKE SUPERIOR BY M/V "CISCO": Studies on the life history of fish in southeastern Lake Superior were begun by the U.S. Bureau of Commercial Fisheries research vessel Cisco. The primary objectives of the work by the Cisco during 1959 will be to determine the abundance, composition, and distribution of the fish stocks, with emphasis on lake trout and chubs. Much of the life-history and population studies of lake trout in 1953 by the Cisco will be repeated this year to determine what changes have taken place during the past 6 years of severe sea-lamprey infestation.

Cruise 1 (May 19-June 2, 1959): The first cruise of the 1959 season covered the southeastern area of Lake Superior from Marquette to Whitefish Bay. A major portion of the cruise was spent fishing gill nets. Some trawling and hydrographic work was done.

The gill nets used this year are made to fit, as closely as possible, the standards established for this type of gear by the several agencies investigating the fisheries of the Great Lakes. Ordinarily, the gangs which the Cisco will set include a "standard gang," also used by the research vessel Siscowet in the western end of Lake Superior, plus some additional mesh. A standard gang will be as follows: 150 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh; 200 feet of 2-inch mesh; and 300 feet each of $2\frac{1}{8}$ -, $2\frac{1}{2}$ -, 3-, $3\frac{1}{2}$ -, 4-, $4\frac{1}{2}$ -, 5, $5\frac{1}{2}$ -, and 6-inch mesh. The length of each mesh may be varied, however, to assure a representative catch of fish vulnerable to each mesh size.

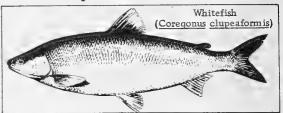
Standard gangs were set at $2\frac{1}{2}$ and 36 fathoms in Munising Bay, at 25, 50, 75, and 100 fathoms off Grand Marais, and at 13, 25, 50, and 70 fathoms in Whitefish Bay. A smaller gang (100 feet each of 2- and $2\frac{1}{2}$ -inch mesh and 300 feet of $3\frac{1}{2}$ -inch mesh) was also set at 36 fathoms in Munising Bay. The greatest numbers of chubs (Leucichthys sp.) were



taken at 50 and 75 fathoms off Grand Marais and at 50 fathoms in Whitefish Bay. L. reighardi, which was near the end of its spawning season, predominated off Grand Marais (of 152 chubs caught at 75 fathoms, 95 were L. reighardi) and together with L. hoyi made up the bulk of the chub catches in most other sets. Other chubs included L. kiyi (44 off Grand Marais at 75 fathoms, a few elsewhere) and L. zenithicus (very few).

Lake herring were fairly numerous in the 13-fathom set in Whitefish Bay, but only a few were taken in other sets. A total of 17 lake trout was caught in the gill nets-all but one in 50-fathom nets. They ranged in length from 11.5 to 21.8 inches. One of the trout carried a tag indicating it was a hatchery fish. Whitefish were taken only in Muni-

sing Bay, 73 in the 36-fathom sets and 1 in the $2\frac{1}{2}$ -fathom nets. Twenty menominee (round) whitefish were caught in the 13-fathom set in Whitefish Bay and in the $2\frac{1}{2}$ -fathom gang in Munising Bay, but they were scarce or lacking in other sets. Other species taken in the gill nets were burbot (a few at all depths), longnose suckers (47 in the $2\frac{1}{2}$ -fathom set in Munising Bay, 2 in the 13-fathom gang in Whitefish Bay), white suckers (26 at $2\frac{1}{2}$ fathoms in Munising Bay), smelt (27 at 25 fathoms in Whitefish Bay, uncommon elsewhere), alewives (2 in the 50-fathom set in Whitefish Bay), and lake northern chubs (15 at $2\frac{1}{2}$ fathoms in Munising Bay).



Trawls were towed at several depths ranging from 8 to 36 fathoms off Laughing Fish Point, in Munising Bay, and off Grand Marais. Most catches were extremely light and nothing was taken in some tows. Species represented were ninespine sticklebacks, trout-perch, smelt (mostly yearlings), slimy sculpins, deep-water sculpins, L. kiyi, and whitefish (the latter two species taken at 25 to 34 fathoms in Munising Bay).

Hydrographic information (water samples for oxygen, pH, alkalinity, and other chemical determinations, bottom and plankton samples, Secchi-disc readings, bathythermograph tracings) was collected at 45 fathoms off Grand Marais and 70 fathoms in Whitefish Bay. Similar data were collected from the former area in 1953 by the Cisco.

Lake Superior water was very cold during this cruise, averaging about 2° C. (35.6° F.) away from shore. Extremes recorded were 1.5° C. (34.7° F.) and 9.2° C. (48.6° F.). The water was generally homothermous vertically, but at some stations slight warming in the upper levels was apparent. On a few occasions bathythermograph tracings showed colder water in the upper strata than below.

Cruise 2 (June 9-23): During this cruise, the <u>Cisco</u> operated in that portion of southeastern Lake Superior between Munising and Keweenaw Bay, Mich.

Standard gangs of gill nets were set at 15 fathoms in Shelter Bay, and at 25, 38, 50 (2 gangs), 75, and 100 fathoms off Marquette, and at 25, 38, 50, and 80 fathoms in Keweenaw Bay. The 15-fathom net in Shelter Bay yielded only 4 fish, all lake herring. Chub catches off Marquette were light at 25 fathoms (only 2) and 100 fathoms (43), and moderate at 38 fathoms (116), 50 fathoms (average of 105 per gang), and 75 fathoms (212). Leucichthys reighardi made up 84 percent of the catch at 38 fathoms and constituted the bulk of the catch together with L. hoyi at 50 fathoms and L. kiyi at 75 and 100 fathoms. A few each L. zenithicus, L. nigripinnis, and lake herring were also taken. Most L. reighardi has spawned, but a few ripe and gravid ones remained. Four lake trout were caught at 25 fathoms, 6 at 38 fathoms, 7 to 50 fathoms (both gangs), and 4 at 75 fathoms. The latter 4 were siscowets, 5 to 7 pounds

each. All lake trout in good condition were marked with spaghetti tags and released. Of special interest was a brook trout taken in the 100-fathom nets. Other species caught in the gill nets off Marquette were burbot (all depths—the smaller ones in deeper water) and deep-water sculpins (75 and 100 fathoms only).

Chub catches in Keweenaw Bay were light at 25 and 80 fathoms (64 and 47 respectively), and moderate at 38 and 50 fathoms (236 and 164 respectively). L. hoyi was the most common species at 38 and 50 fathoms, especially at the former depth where it made up 81 percent of the catch. L. zenithicus was the most numerous of the chubs at 25 fathoms and L. reighardi at 80 fathoms. L. reighardi appeared at all depths in fair numbers. Lake herring were taken at all depths except 50 fathoms, but were not numerous except at 25 fathoms. L. kiyi was absent at 38 fathoms and scarce at all other depths. Other species were lake trout (1 at 25 fathoms, 2 at 38 fathoms, one of the latter a finclipped hatchery trout), smelt (a few in the small mesh at 25 fathoms), burbot (1 at 50 fathoms), pygmy whitefish (2 at 38 fathoms) and sauger (a $1\frac{1}{2}$ -pound specimen at 38 fathoms, a rather unusual catch).

Trawls were towed at several depths from 14 to 35 fathoms in Shelter Bay, 8 to 20 fathoms near Traverse Island in Keweenaw Bay, and 24 to 46 fathoms near Pequaming Point in Keweenaw Bay. The trawling in Shelter Bay yielded a few slimy sculpins, ninespine sticklebacks, small smelt, small coregonids, trout-perch (rare), and pygmy whitefish (17 fathoms and deeper). No baby lake trout were caught, although they were fairly numerous in the area at this time of year in 1953. No lake trout were taken off Traverse Island either, but this area was somewhat more productive than Shelter Bay in other species. Slimy sculpins were numerous and ninespine sticklebacks fairly common from 8 to 15 fathoms, and 2- to 4-inch smelt (probably yearlings) were abundant from 8 to 12 fathoms. Pygmy whitefish were taken at 15 fathoms (8) and 20 fathoms (5). Other species were menominee whitefish (a $4\frac{1}{2}$ -inch one at 8 fathoms), 2- to 3-inch coregonids (mostly at 15 fathoms). and trout perch (rare 15-20 fathoms).

In the tows off Pequaming Point catches were by far the largest. A total of 19 lake trout were caught, of which 15 (about 8 inches in length) were recently stocked in Keweenaw Bay. The others were natural stock. Twelve of the trout were caught in a single 10-minute tow from 40 to 28 fathoms. On the basis of the rather scanty evidence at hand, the natural stock of small lake trout in Keweenaw Bay seems appreciably smaller than at this time in 1953. The trawls in the Pequaming Point area brought up large numbers of L. hoyi (635 in a 10-minute tow at 35 fathoms). Nearly 4,000 small (3- to 4-inch) unidentified coregonids, probably mostly hoyi, were caught in a tow at 25 fathoms. The other species of chubs were present in much smaller numbers. As many as 148 pygmy whitefish were caught per tow. Adult smelt were common at 25 fathoms, and some were caught as deep as 40 fathoms. Ninespine sticklebacks and slimy sculpins were common at all depths. Troutperch were rare. A few deep-water sculpins were caught at depths greater than 40 fathoms.

Hydrographic data and samples were collected in Shelter Bay (15 fathoms), off Big Bay Point (45 fathoms), and in Keweenaw Bay (30 fathoms). The station off Big Bay Point was visited regularly in 1953. Drift bottles were released at 5 locations between Big Bay Point and Keweenaw Bay.

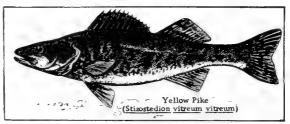
Surface-water temperature had risen considerably since Cruise 1, and thermal stratification was evident in all but the deepest areas visited. The surface temperature range was 2.9° C. to 14.1° C. $(37.2^{\circ}$ F. to 57.3° F.).

Note: Also see Commercial Fisheries Review, July 1959, p. 31.

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WESTERN LAKE ERIE BIOLOGICAL RESEARCH CONTINUED (M/V" George L." Cruises 3 and 4): Cruise 3 (May 1959): The first of three "Index" cruises slated for 1959 was completed by the U. S. Bureau of Commercial Fisheries research vessel George L. Seven stations in the western end of Lake Erie were visited, and fish were collected by trawl, gill net, and small tow nets. Perch and spottail shiners were the most common fish taken in the trawls. Other less abundant species were smelt, sheepshead, and emerald shiner. Yellow perch and sheepshead were the most common species taken in the gill nets. Small gizzard shad and alewives, abundant in trawl catches late in 1958, have not been taken by trawl or gill net this year. Only one yellow pike (walleye) was taken during the cruise.

Tow nets, used to capture fish fry, caught mostly yellow perch and smelt. Yellow perch fry were found in all areas of western Lake Erie but were taken in greatest numbers in Sandusky Bay and near Middle Bass Island. Smelt were also found at nearly all stations. Yellow perch and smelt fry were usually found near the bottom and at midwater in the open lake. A few yellow pike fry were taken in Sandusky Bay.



In late May, Bureau biologists cooperated with the Ohio Division of Wildlife in conducting a study of the behavior of movement of stocked yellowpike fry in the open waters of Lake Erie. Previous to the stocking east of Middle Bass Island, tow nets were used to determine the abundance and species composition of fry already present in the area to be stocked. Yellow perch sac fry were found to be abundant. No yellow pike fry were taken. Two and one-half million yellow pike sac fry were then stocked in a 1-acre area, marked with buoys, over a mud bottom in 22 feet of water. Tows at all depths in the marked area and surrounding waters shortly after stocking caught yellow pike fry, but the total catch of all fry increased by only 28 percent. A large percentage of the fry taken was near the bottom. Three hours after stocking few yellow pike fry were captured although perch fry were still taken in large numbers. Tows in the area one week later caught no yellow pike, but perch fry were still present.

Limnological and meteorological data collected at each index station included bottom organisms, plankton, water temperatures, turbidity, water quality, oxygen, weather and sea conditions, water currents... Water temperatures were much higher in 1959 than during the same period in 1958. In late May of 1958 and 1959 surface water temperatures in the western basin averaged about 62° F. and 70° F., respectively.

Diatoms were common in Lake Erie water in early May but were much less abundant in late May when Entomostracans, principally Daphnia, Leptodora, and Diaptomus, became concentrated at midwater and bottom depths.

Cruise 4 (June 1959): Much of the month was spent locating young fish and measuring their relative abundance in the western basin and Sandusky Bay, Eighty 10-minute trawl hauls were made by the George L. and Madtom in the Sandusky Bay, Bass Islands, and Port Clinton areas between June 15 and July 1.

Young yellow perch appeared in large numbers in almost all waters west of Huron, Ohio, but were most abundant in Sandusky Bay. Young perch were about 1 inch long by mid-June and about 1.5 inches long by the end of the month.



Young smelt were common in all catches but appeared to be most abundant in water over 20 feet deep. Young white bass and gizzard shad were caught in fairly large numbers by the end of the month in Sandusky Bay but only a few had been taken from the lake proper. Young spot-tail shiners and trout-perch were found at almost all stations—young sheepshead were taken in Sandusky Bay only. The first hatches of emerald shiners were observed during the last week of June.

Catches of young yellow pike were made in Sandusky Bay, in the immediately adjacent lake area, and in the bay between Catawaba Point and Port Clinton. Their lengths ranged about mean of $2\frac{1}{2}$ to 3 inches. In the main lake most young yellow pike were taken over both mud and sandy bottoms in water between 10 and 20 feet deep. Only one young yellow pike was taken in the Island area.

The food habits of some of the fish were observed during the period. Yearling white bass 4-6 inches in length fed almost entirely upon young perch. Young spot-tail shiners, white bass, smelt, and walleye, and adult spot-tail and emerald shiners were also found in white bass stomachs.

Food of the baby yellow pike consisted almost entirely of young fish about 1-inch long, most of which appeared to be young yellow perch. Large

sheepshead, yellow perch, and channel catfish occasionally gorged on young fish, although the bulk of their food consisted of non-fish items.

Note: Also see Commercial Fisheries Review, July 1959, p. 32.

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WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED (M/V Siscowet Cruise 2); Environmental conditions were studied at three index stations, two of which were established by the U. S. Bureau of Commercial Fisheries research vessel Siscowet during the 1958 season. These index stations are located (1) southeast of Stockton Island, (2) northeast of Bear Island, and (3) east of Pike's Bay. The station east of Pike's Bay replaces a previous station located north of Little Girl's Point, Mich.

At each index station standard gill-net gangs (1" to 5" by $\frac{1}{2}$ " intervals) were fished. From one to three trawl tows were made at each station with a 30-foot semi-balloon trawl. Water temperatures, water samples for chemical analyses (dissolved oxygen, total alkalinity,...), plankton and bottom samples, Secchi-disc readings, and observations of currents were also recorded.

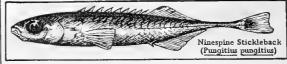
In addition, various types of experimental gear were fished northwest of Michigan Island, east of Oak Island, west of Bear Island, and east of Raspberry Island. The gear consisted of small-mesh trawls and gill nets, $\frac{1}{2}$ -meter plankton nets (32 grit cloth), $\frac{1}{8}$ - and $\frac{1}{4}$ -inch mesh minnow traps, and standard 300-hook bait lines.

Gill-net catches southeast of Stockton Island (25 fathoms) took small numbers of lake trout, white-fish, menominee whitefish, longnose suckers, and burbot. Trout-perch dominated the catch from three trawl tows. Other species taken in the trawl



were chubs (<u>Leucichthys hoyi</u>), pygmy whitefish, smelt, ninespine stickleback, slimy muddler, lake herring, and lake trout. A 12-inch diameter plankton net (No. 0 mesh) attached to the trawl took one fish larva, tentatively identified as smelt.

Gill nets set northeast of Bear Island (38 fathoms) took 558 L. hoyi with lesser numbers of L. zenithicus, L. kīyī, lake herring, and lake trout. One adult alewife, the first encountered by the Siscowet in Lake Superior, was also taken in this set.



L. hoyi dominated the catch from two trawl tows. Other species taken were L. zenithicus, smelt, ninespine stickleback, slimy muddler, spoonhead muddler, and herring. The 12-inch diameter plankton net took one unidentified fish larva.

The gill nets east of Pike's Bay (22 fathoms) took 408 smelt, 106 L. hoyi, and 22 lake trout.

Lesser numbers of longnose suckers, lake herring, and trout-perch were also captured. One trawl tow captured 276 smelt, 59 L. hoyi, 7 lake trout, and 1 whitefish. Large numbers of trout-perch and a few slimy muddlers and ninespine sticklebacks were also taken.

One 300-hook line baited with small chubs (L. hoyi) was set between Madeline and Stockton Islands. The line was lifted 3 days later, and the catch consisted of 3 burbot and one small lake trout.

Six wire minnow traps were set southeast of Stockton Island and northwest of Michigan Island. At each location a trap was set at 1, 5, 10, 15, 20, and 30 fathoms. Some of the traps were baited with bread, crackers, and cheese. Others were unbaited. A very few slimy muddlers and sticklebacks were the only species taken at both the Stockton and Michigan Island sets.



A set of three gill nets $(1-, 1\frac{1}{2}-, \text{ and } 2\text{-inch mesh})$ east of Oak Island (15-27 fathoms) took mostly smelt and L. hoyi. Lesser catches of L. zenithicus, lake herring, and lake trout were taken.

Trawl tows east of Raspberry Island were made at 5 fathoms and 16 fathoms. The tow at 5 fathoms took 900 ninespine sticklebacks with lesser catches of slimy muddlers, smelt, menominee whitefish, and lake herring. The tow at 16 fathoms took 15 smelt with lesser catches of trout-perch, sticklebacks, slimy muddlers, and lake herring.

Trawl tows west of Bear Island were made at 6 fathoms and 13 fathoms over a sandy bottom. The catch at 6 fathoms was dominated by ninespine sticklebacks. A few small smelt, and slimy muddlers were also taken. At 13 fathoms the slimy muddlers dominated the catch. Several fish larvae and 4 yearling lake herring were taken at this depth.

Surface temperatures varied from 40.2° F. northeast of Bear Island to 56.7° F. west of Bear Island. Bottom temperatures varied from 40.5° F. southeast of Stockton Island (40 fathoms) to 42.8° F. at Pike's Bay (20 fathoms). Slight thermal stratification appeared east of Pike's Bay.



Gulf Exploratory Fishery Program

UNDERWATER OBSERVATION OF SHRIMP TRAWL (M/V Charles M. Bowers Cruise 20): Underwater observations of the operation of a 40-foot flat shrimp trawl were made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers June 2-23. The work was carried out in the vicinity

of Eleuthera Island, Bahama Islands, an area characterized by clear water conditions and smooth white sand bottom, at depths of 30 and 40 feet.

The observations were made from a diving sled manned by two SCUBA divers while being towed by the vessel. Motion pictures of the trawl and trawl boards were obtained with underwater cameras mounted on the sled.



U. S. Bureau of Commercial Fisheries exploratory fishing vessel <u>George M. Bowers</u>.

This is the first of a scheduled series of cruises to obtain photographic records of the performance of the various designs of trawling gear used in the United States' shrimp fishery.



Gulf of Mexico

INDUSTRIAL FISHERY STUDIES: The heaviest industrial fishing in the Gulf of Mexico occurs in Mississippi Sound and off the Mississippi River Delta in waters less than 20 fathoms deep. This was revealed by studies conducted by the U.S. Bureau of Commercial Fisheries Galveston, Tex., Biological Laboratory. The fish caught by the Gulf industrial fishery are used for pet food, fish meal for hog and poultry feed, frozen mink food, and fish oils. There are 104 species, comprising 55 families, represented in the

catches. Croakers, spots, white trout, and porgies account for about 75 percent of the catch.



lowa

REGULATIONS ON COMMERCIAL FISHING ON THE MISSISSIPPI RIVER
ENFORCED: Since June 15, Iowa conservation officers have been making a concentrated check of commercial fishing equipment on the Mississippi River along the southern half of the State. So far they have confiscated more than 200 pieces of illegal gear (including 200 baskets, 107 hoop nets, 7 trammel nets, and one gill net) valued at \$4,000-\$5,000. If not claimed, the gear will be disposed of by the State Conservation Commission.

The new regulations which went into effect July 4 are of importance to persons now engaged in commercial fishing. Owners of fishing equipment must have a \$15 owner's certificate and anyone using such gear must have an operator's license costing one dollar, obtainable from the State Conservation Commission in Des Moines. A pole-and-line fisherman can have one trot line and one fish trap without an operator's license, but must pay a dollar per trot line and trap. Copies of the revised laws are available from the Des Moines offices of the Iowa Conservation Commission and from conservation officers of the counties border ing the Mississippi and Missouri rivers.



Maine Sardines

CANNED STOCKS, JUNE 1, 1959: Distributors stocks of Maine sardines totaled 197,000 actual cases on June 1, 1959--down 40,000 cases or 17 percent from the 237,000 cases on hand June 1, 1958. Stocks held by distributors on April 1, 1959, amounted to 254,000 cases, and on January 1, 1959, totaled 268,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on June 1, 1959, totaled 272,000 cases (100 $3\frac{3}{4}$ -oz, cans), an in-

crease of 37,000 cases (16 percent) as compared with June 1, 1958, and a decrease of 69.5 percent (619,000 cases) from the 891,000 cases on hand January 1, 1959.

Table 1 - Canned Maine Sardines Wholesale Distributors' and Canners' Stocks, June 1, 1959, with Comparisons 1								
1059/50 C								
Type	Unit	6/1/59	4/1/59		11/1/58			
Distributors	1,000 Actual Cases	197	254	268	312			
Canners	1,000 Standard Cases	272	474	891	1,037			
Туре	Unit		1957/58	Season				
-7P0		7/1/58	6/1/58	4/1/58	1/1/58			
Distributors	1,000 Actual Cases	237	293	230	184			
Canners	1,000 Standard Cases	235	476	1, 111	386			

1/Table represents marketing season from November 1-October 31. 2/100 33-oz. cans equal one standard case.

The total supply at the canners' level (packing season beginning April 15, 1958, and ending December 1, 1958) as of June 1, 1959, amounted to 2,434,000 standard cases, about 4.3 percent less than the total supply of 2,543,000 cases as of June 1, 1958. The carryover on April 15, 1959, was about 420,000 cases. No appreciable quantity of sardines was canned April 15-June 1, 1959.

The packing season opened on April 15, 1959, but packing did not start until about June 1. The early catches were made up of fish too large for canning.

* * * * *

MASSACHUSETTS SCHOOLS' WORK-SHOP MORNING SESSION DEVOTED TO MAINE SARDINES: Maine sardines played a major role in the 25th Annual Workshop of the State of Massachusetts educational system, held at Fitchburg in mid-July. One entire morning program, attended by several hundred school-lunch supervisors and home economists,

The showing of a film on the Maine sardine industry was followed by an hourand-a-half demonstration on the uses and preparation of canned Maine sardines in school lunches.

was devoted to canned Maine sardines.

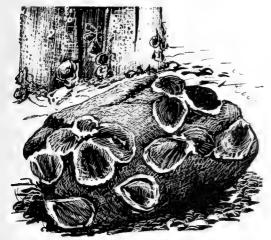
The Maine Sardine Council said that, "This is the kickoff of a major effort to promote the use and sale of Maine sardines in the vast national school-lunch program."

He said that Massachusetts alone served more than 45 million school lunches a year and participation in the Workshop came after the Council had held acceptability tests in a number of that State's schools. According to the Council, school authorities are looking for low-cost, nourishing fish products for school-lunch programs and it appears that sardines have a great opportunity to develop a major new market in this type of promotion.



Maryland

OYSTER SPAT COUNT ON TEST SHELLS, 1959 SEASON: Biologists of Maryland's Chesapeake Biological Laboratory are studying the number of oyster spat found on 20 clean faces of shells exposed in small wire bags for approximately 1-2 week intervals to determine the intensity of the oyster set in Maryland's waters. Most of the spat are of microscopic size since new shells are used for each exposure.



Oyster spat (magnified many times) on small pebble.

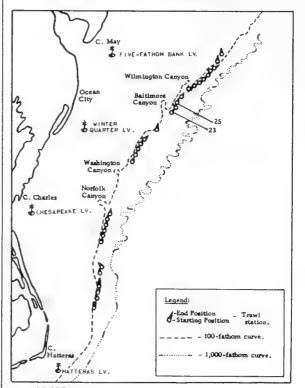
Water temperatures high enough to initiate spawning were reached in all collecting areas during late May and early June. A few spat appeared at some stations in early June. Mid-June was

marked by a cool spell that dropped water temperatures by as much as 10° F. During late June water temperatures rose into the eighties. An onset of fair setting occurred in St. Marys River, Holland Straits, and Smith Creek during the first week of July. The attachment of fouling organisms to the cultch was light up to the early part of July.



North Atlantic Fisheries Exploration and Gear Research

PROMISING CATCHES OF THE DEEP-WATER RED CRAB MADE BY M/V'DEL-AWARE''(Cruise 59-7): Promising quantities of red crabs (Geryon quinquedens) were found between Cape Hatteras, N. C., and Cape May, N. J., in depths of 200-350 fathoms during an exploratory fishing cruise by the U. S. Bureau of Commercial Fisheries vessel Delaware.



M/V Delaware Cruise 59-7 (June 25-July 2, 1959).

The crab exploration began at Norfolk on June 25 and ended July 2, when the Delaware reached Gloucester, Mass.

In the course of the cruise, 30 exploratory trawl stations were made to investigate the commercial potential of red crabs, the presence and abundance of which were reported by W. C. Schroeder (1955) following explorations in 1952-53. The depths trawled ranged from 60-350 fathoms. Red crabs were caught at 21 stations; the most productive stations were in depths of 200 fathoms or more. A total of 1,375 crabs were taken (the estimated weight was 2,073 pounds).

The largest single catch of crabs was made east of Ocean City, Md. (see chart, station 25). The red crab catch at this station was 386 crabs in a 70-minute tow; the estimated weight of this catch was 558 pounds. This was the only station from which crabs were taken in near commercial quantities. Further investigations may define areas of local concentration where commercial exploitation could be feasible.

Several hundred red crabs were steamcooked aboard the vessel so that the crew members could taste-test the meat. The consensus was that the meat was excellent.

A total of 32 lobsters (Homarus americanus) were taken from 11 stations in depths ranging from 60-275 fathoms. The largest single catch was 12 lobsters at station 23 (see chart). Whiting (Merluccius bilinearis) was found to occur at most of the stations in quantities ranging from 5-100 pounds per tow. No other commercially-valuable species of fish or shellfish were caught in appreciable quantities.

A standard New England type No. 36 net (60-foot headrope, 80-foot footrope) with chain-weighted footrope and $\frac{1}{4}$ -inch liner was used. The net was rigged with 10-fathom ground cables. No gear loss or significant damage was experienced.

In cooperation with Woods Hole Oceanographic Institution, a total of 576 drift bottles were released from 96 locations. Biological specimens were collected and preserved for later study. Bathythermograph casts were taken along with other hydrographic data.

The M/V <u>Delaware</u> left Gloucester, Mass., for cruise 59-8 on July 8, 1959.

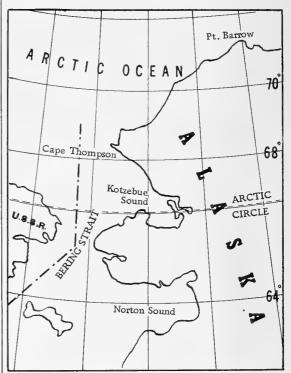
After loading television equipment at Woods Hole, Mass., the vessel was expected to conduct closed circuit underwater television operations off Cape Cod.

Conditions permitting, kinescope recordings were to be made showing the operation of various portions of the trawl net in operation.



North Pacific Exploratory Fishery Program

EXPLORATORY FISHING VESSEL TO ASSESS FISHERY POTENTIAL AND COLLECT OCEANOGRAPHIC DATA IN ARCTIC OCEAN'S CHUKCHI SEA (M/V John N. Cobb Cruise 43): The U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb departed from Seattle on July 23 for a 60-day cruise which will take the vessel 3,300 miles to



M/V John N. Cobb Cruise 43 (July 23-Sept. 15, 1959).

Chukchi Sea in the Arctic Ocean. The investigation in the Chukchi Sea, which will be a cooperative study carried out by the Bureau and the U. S. Atomic Energy Commission (AEC), will be the farthest that

the vessel has operated from Seattle since its launching in 1950. She will return to Seattle, Wash., about September 15.

The John N. Cobb is scheduled to carry out explorations in the area from Bering Strait north to the Arctic ice field. The vessel will carry out investigations contiguous to the coast of northwest Alaska and westward to the United States-Soviet treaty line of 1867.

The objectives of the cruise are to carry out detailed studies of the varieties, quantities, and distribution of fish, shellfish, marine mammals, and birds inhabiting the Chukchi Sea region and to acquire information on the physical and chemical properties of these Arctic waters. The information obtained concerning the concentrations of fish and shellfish will be used to assess the commercial fishing potential of the region, and to provide the AEC with data to evaluate the possible biological damage which might occur in the event nuclear devices are detonated in the area. The Commission is studying the possibility of detonating several atomic devices to determine the feasibility of using nuclear energy for excavating harbors, canals, etc. Oceanographic information will be used to supplement data being acquired by the University of Washington oceanographic vessel Brown Bear.

The Bureau's vessel will be equipped with perhaps the widest variety of sampling devices ever taken on an exploratory fishing expedition. Sampling gear which will be aboard will include standard mesh otter trawls, small mesh trawls, biological dredges, gill nets of various mesh sizes, fish traps, long-line gear, beach seines, and a midwater trawl. Skin divers will also be aboard the vessel. Evaluation of the marine fauna will be approached in a three-phase program. The first phase will entail a study of the bottom fish fauna which will cover an area from Bering Strait to 700 north latitude. During this phase approximately 50 stations will be sampled. The second phase will constitute an intensive study of the fish fauna in the immediate vicinity of the Cape Thompson or Ogotoruk Creek site proposed for the AEC excavation tests. During the last phase sampl-

ing of pelagic fish life will be carried out throughout most of the Chukchi Sea region. It is anticipated that more than 100 sites will be investigated during the 30 days in the Arctic.

Personnel chosen to accompany the John N. Cobb will include several Seattle scientists from the Bureau and the University of Washington College of Fisheries.

In carrying out the operations in the Chukchi Sea, the John N. Cobb's work will be closely integrated with studies being conducted by the University of Washington oceanographic vessel Brown Bear. The cruise patterns and objectives of both vessels have been designed so that maximum benefits can be derived from the Arctic studies. Both vessels will be in constant radio contact with each other and with the shore camp at Ogotoruk Creek.

The major difficulty anticipated in operating in the Chukchi Sea will be that of accurate navigation. Navigation in the area is made difficult by large and fluctuating deviations in the earth's magnetic field and by the absence of conventional electronic fixing techniques such as loran or shoran. The almost continuous summer daylight of the area and persistent fog will make celestial navigation almost impossible. Both vessels anticipate using radio direction-finders and radar to fix their positions.



Outdoor Recreation Resources

Review Commission

FIRST ADVISORY COUNCIL MEET-ING HELD: The Outdoor Recreation Resources Review Commission met in Washington on July 16 and 17 for the purpose of consulting with the Advisory Council. The Commission consists of 15 members, 4 each from the Senate and House Committees on Interior and Insular Affairs, and 7 appointed by the President, including Chairman Laurance Rockefeller. The Advisory Council consists of 25 representatives of various phases of natural resources, including commercial fisheries.

The 25 were selected out of a group of 500 considered by the Commission.

The commercial fishery representative (Charles E. Jackson, General Manager of the National Fisheries Institute), made a brief statement calling the Commission's attention to the vital importance of the food fisheries. He noted the fact that the United Nations is considering the breadth of the territorial-sea issue which might result in a change of the present 3-mile limit accepted by many of the nations of the world. He pointed out that whatever the decision it is highly important that the United States now consider means of improving and increasing its production of coastal inshore fisheries. He requested the Commission to give this matter serious study with a view of recommending a research program in inshore areas, looking toward an increased production of fish to meet not only domestic food needs but the increasing requirements of anglers. He said it was necessary to know more about the possibilities of fish farming in estuaries along the coasts.



Oysters

LONG ISLAND SOUND STUDIES: As in previous years, the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., is conducting systematic observations on spawning and setting of oysters and starfish. The same locations as in the past will be used for the 10 major sampling stations. In addition, auxiliary stations, needed for other studies, will be established at the mouths of several rivers.

The Milford Laboratory will keep the members of the oyster industry and marine biologists informed as to the progress of the biological events occurring in Long Island Sound waters. These will deal principally with the intensity of setting of oysters and starfish in various areas and the survival and growth of these organisms. Other observations of interest will be included.

The bottom water temperature recorded on July 13 varied from 16.6° C.

(61.90 F.) at Station No. 3 at a 30-foot depth in the Bridgeport area to 21.80 C. (71.20 F.) in the shallow water of New Haven Harbor. Examination of gonads showed that some of the oysters have spawned, but no larvae have yet been found in the plankton samples. This, however, is not abnormal for Long Island Sound. For example, last year when one of the heaviest oyster sets in the history of the Connecticut shellfish industry occurred, larvae were not found in any of the 200-gallon plankton samples taken regularly at sampling stations until July 24, when a few young ones were recorded; yet, a heavy setting began only four days later. Thus, because of the peculiarities of the occurrence and distribution of larvae in Long Island Sound waters, many aspects of which are still not understood, predictions as to the time and intensity of setting cannot be made from observations on number and age of larvae.

No setting of oysters had occurred by July 13, and it is assumed that it will take place somewhat later than usual because of the relatively low water temperature.

Examination of collectors showed that setting of starfish began on July 2, occurring at most of the stations. The initial set was comparatively light, the maximum being nine starfish per 40 shells at Station 10. The bags collected on July 10 showed that setting continued, and that while no setting had taken place since July 6 at Stations 4 and 5, its intensity at Station 8 in the Bridgeport area considerably increased, the count being 28 starfish spat per 40 shells. The collectors examined on July 13 showed a general decrease in the intensity of the setting with Stations 3, 6, and 7 being free of any set, while only 2 spat were found on 40 shells brought from Station 10. (Observations on Spawning and Setting of Oysters and Starfish in Long Island Sound, Bulletin 1, July 17, 1959.)

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RAFT-GROWN TYPE GROW FAST: Studies in Oyster River, Chatham, Mass., showed oysters grown on rafts grow faster and are healthier than those grown on bottoms. The oysters suspended below a raft are expected to reach marketable size by the fall of 1959, when they will be two years old. If they had been bottom-grown instead of raft-grown, they would have required 4 or 5 years to reach that size. The mortality of raft-grown oysters was 17 percent in 1958 and over 90 percent in bottom-grown oysters. The studies are being conducted by the U. S. Bureau of Commercial Fisheries.

SETTING UNDER ARTIFICIAL CONDITIONS: In an artificial pond on Long Island, successful sets of American oysters were obtained by releasing readyto-set larvae in the pond. Light sets of European oysters, Ostrea edulis, and Japanese clams, Tapes semidecussata, also were obtained in that pond.



Salmon

PROGRESS REPORT ON NORTH PA-CIFIC RESEARCH: Salmon studies in the offshore and inshore areas of the North Pacific Ocean by the U.S. Bureau of Commercial Fisheries Seattle, Wash., Biological Laboratory for the International North Pacific Fisheries Commission (formed by Canada, the United States, and Japan) have progressed steadily. Two chartered vessels completed 78 gill-net sets in the North Pacific and Bering Sea during the spring and the summer of 1958. The catch of 5,462 salmon included 1,190 reds or sockeye. 3,877 chums, 194 pinks, 175 silvers, and 26 kings. Compared with the catches in 1957, catches in 1958 reflect a marked decline in the abundance of pink salmon. Chum salmon were in comparable numbers both years.

The widespread salmon sampling program throughout the North Pacific Ocean and adjoining seas and coastal areas featured increased sampling coverage off the Asian coastline. Red, chum, and pink salmon samples collected by the United States, Canada, and Japan for racial studies totaled 21,632 whole salmon and 2,319 salmon blood samples. Extensive catches are also being made during the current 1959 season.

The second season of experimental work on guiding seaward migrant fingerling salmon with electricity at the Lake Tapps, Green River, Wash., field site is in progress. Results show at least 90 percent of the yearling and two-year-old silver salmon moving through the area are diverted into bypass traps by the electrical barrier which is operating at an economic power consumption level. These findings also indicate the probability of future reductions in electrical and mechanical instrumentation and show that under certain circumstances electricity can be efficiently used to divert migrating fingerling salmon.

Surveys of the Yakima River system indicated the chinook salmon escapement in 1958 was slightly less than half that in 1957. The downstream migrant trapping project at Prosser resulted in counts of 145,000 chinook and silver salmon from April 1 to June 1, 1959. Surveys above Rocky Reach Dam indicated fish passed that dam through temporary fish passage facilities without noticeable bad effects.

In Alaska efforts are being made to predict the number of adult salmon which will return from the Pacific Ocean to the streams to spawn. Pink salmon fry in Southeastern Alaska and in Prince William Sound were dyed with neutral red stain, released, and trapped downstream. In the Bristol Bay area, the commercial catch was sampled for age composition, adult red salmon were enumerated from towers, and downstream migrating red salmon smolts enumerated with fyke nets.

Studies to determine the fresh-water survival of salmon in Alaska continued. At Little Port Walter a count was made of upstream migrating adult pink salmon and downstream migrating fry. Experiments with young pink salmon in the stream gravel were conducted to measure their survival rate. Research at Brooks Lake concerned the factors affecting the survival of red salmon in the Lake.



Shad

ATLANTIC COAST STUDIES: Observations on the Hudson River and the Connecticut River shad populations were continued in the spring of 1959 by biologists of the U.S. Bureau of Commercial Fisheries Beaufort, N. C., Biological Laboratory. The studies indicate that the Connecticut River population is approaching its 1941-1946 size when the best recorded catches were made. This increased population abundance resulted from an increased number of shad which were allowed to escape the fishery and spawn as a result of state regulations based on the recommendations of the Bureau's biologists. The fishway on the Connecticut River at the Hadley Falls Dam, Holyoke, Mass., passed some 15,000 shad during the 1959 shad run.

Research on managing the Atlantic coast shad resources centered on the St. Johns River, Fla., during the 1958-59 shad run. Through use of catch, effort, and tagging data a method was devised to determine the shad population in that river for each year in which such data are obtained.



Shrimp

STAINS USED TO MARK SHRIMP FOR MIGRATION STUDIES: Techniques for marking shrimp with vital stains which permit them to molt and retain the mark have been developed by the U. S. Bureau of Commercial Fisheries, Galveston, Tex., Biological Laboratory. Using this method, the Laboratory scientists stained juvenile pink shrimp in the protected bays of the Everglades National Park and recaptured them four months later in the Tortugas shrimp fishery. They had tripled their weight and traveled more than 100 miles. Stained brown shrimp recaptured in Galveston Bay had traveled up to 25 miles a week.

* * * * *

TEXAS VESSELS DISPUTE OVER WAGES SETTLED: A dispute which reportedly tied up approximately 90 percent of the 500 to 600 shrimp boats op-

erating between Brownsville and Port Isabel, Tex., was settled on July 10. The dispute affecting the \$15 million a year shrimp industry in that area reportedly stemmed from a wage cut for shrimp crews. The shrimp producers reportedly recently cut the money paid to shrimp crews by about 4 cents per pound per crew member.

The Texas producers had contended that producers elsewhere on the Gulf coast and in the East had been selling shrimp cheaper than the local vessels can produce them. Negotiations involving the fishermen and the producers were in progress for about 10 days.

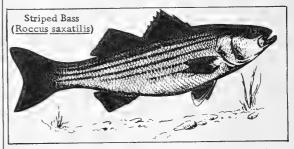
The Brownsville Shrimp Exchange, owners of 20 boats, reported that they had worked out a 60-40 arrangement with the crews. The boat owners will get 60 percent of the catch and the shrimp crews 40 percent. Other shrimp crews sought the same sort of agreement.

Reports indicate that some shrimp fishermen are interested in possible affiliation with AFL-CIO. Representatives of the AFL-CIO met with the executive committee of the Rio Grande Shrimpers Assoc., but no decision was reached.



Striped Bass

EAST COAST RESEARCH: Roanoke River Studies: Dams and pollution in the Roanoke River, Albemarle Sound, N. C., threaten sustained abundance of



the striped bass population. To resolve these problems, a cooperative study for developing this river basin by scientific means began in 1955. Research on the population and spawning status of striped bass in Roanoke River in relation to industrial development and water released from power dams upon the spawning grounds has been completed.

Potomac River Studies: In the spring of 1959, the U. S. Fish and Wildlife Service, Maryland, and Virginia concentrated research on the striped bass on Chesapeake Bay. They tagged 2,200 striped bass in the Potomac River as a part of the research planned to determine seasonal, annual and age-specific migrations, estimates of population size and mortality rates, size and age-class composition, and homogeneity of races.



Transportation

NEW RAILWAY EXPRESS AGENCY CONTRACT APPROVED BY RAILROADS: The 178 railroads participating in the present Railway Express Agency contract have given their unanimous approval to a reorganization plan to be submitted to the Interstate Commerce Commission for approval. The most significant change is to give the Express Agency complete freedom to route ex-

press traffic without reference to a historical distribution pattern which has been followed since 1920. This change

is expected to result in improved service to shippers and improved financial conditions. Another important change is that future payments to the railroads will be based upon an average rate in each regional group 'per car-foot mile of line-haul service rendered by each carrier." The present contract calls for distribution among the railroads of their pro rata share of revenue remaining after the Agency's expenses have been deducted. Future excess funds will be divided equally between the Agency and the carriers, thus providing the Agency with funds to re-invest in the business. The Agency's share of gross revenue on carload shipments will also be increased slightly.

Application will be made shortly for the Commission's approval of the new contract, which will be effective the first of the month following the Commission's approval and will continue in force through December 1973. The New York Central announced that it will rescind its notice to withdraw from the Express Agency and will participate in the new plan, but the Chicago & Northwestern Railway said that it would withdraw from the Agency, sell its stock, but continue to make its facilities available to handle express shipments.

The Railway Express Agency has once more petitioned the Commission for special permission to publish a blanket increase on less-than-carload express rates of 25 cents per 100 lbs., minimum 25 cents per shipment, in all territories except within Mountain Pacific and Eastern territories, where the increase sought is 35 cents per 100 lbs., minimum 35 cents per shipment. This is equivalent to approximately a 6 percent increase and will not apply on accessorial charges. It is alleged that this increase is necessary to offset higher operating costs, including railroad retirement and unemployment insurance taxes.



United States Fishery Landings, January-May 1959

Landings of fish and shellfish in the United States during the first five months of 1959 increased 17 percent as compared with the same period of the previous year.

Menhaden landings with a sharp rise of 124 million pounds accounted for most of the increase. Landings of those fish along the Atlantic Coast and in the Gulf States rose 70 million and 54 million pounds, respectively

On the Pacific Coast, landings of tuna were up 5 million pounds, while halibut, increased 3 million pounds as compared with the 1958 landings. In New England, haddock and ocean perch landings declined 9 million pounds each. Landings of whiting were down 3 million pounds. The yield of shrimp in the South Atlantic and Gulf States also dropped--only 35 million pounds were landed during the first five months of 1959 as compared with 43 million pounds for the same period in 1958.

Table 1 - United St. For Per	ates Fisher riods Shown			ain Species	Table 2 - United for Period	d States Fi ds Shown, 1	shery Land 1959 and 19	ings by Si 58 <u>1</u> /	ates		
Species	Period	1959	1958	Total 1958	Area	Period	1959	1958	Total 1958		
			(1,000 Lb	s.)			(.)			
Anchovies, Calif	5 mos.	1,300	3,474	8,148	Maine	4 mos.	28,000	29,877	316,955		
Cod: Maine Boston Gloucester	4 mos. 5 " 5 "	800 7,100 1,300	788 6, 1 24 1,192	16,183	Massachusetts 2/: Boston Gloucester New Bedford Provincetown	5 mos. 5 " 5 "	50,100 50,300 42,800 4,600	61,836 47,678 43,056 4,448	230,218 111,669		
Total cod		9,200	8,104	22,107		0					
Haddocke Maine	4 mos. 5 "	1,300 34,200 8,500	1,749 45,372 6,132	81,509	Rhode Island 3/ New York 3/ New Jersey 3/ North Carolina 3/.	2 mos. 4 " 5 "	5,800 12,700 23,900 28,100	5,452 13,567 20,660 28,560	491,405 103,452 40,886 49,813 54,866		
Total haddock		44,000	53,253	95,304	South Carolina 3/.	5 " 5 "	3,000 4,700	3,581 4,209	15,358 19,992		
Halibut 2/: Wash. & Oreg Alaska	5 mos.	5,900 6,100	4,8 83 4, 431		Georgia	Florida 3/ Alabama Mississippi 3/	Florida 3/ 4 Alabama 3 Mississippi 3/ 4	4 "3 "	46,000 1,800 2,500 8,600	51,650 1,495 3,001 11,598	153,832 10,343 84,988 66,112
Total halibut		12,000	9,314	36,014	Ohio (MarMay) . Oregon 2/	5 '' 4 ''	10,300 9,400	10,371 13,771	19,145 57,800		
Herring, Maine Industrial Fish,	4 mos.	-	36	170,977	Washington 2/	3 "	20,100	23,655	166,000		
Me. and Mass. 3/ Mackerel, Calif. Jack	5 " 5 "	25,600 8,800	25,603 5,906	21,698	California: Certain species 4/ Other	5 mos.	134,300 15,300	125,482 13,805	,		
Pacific	5 ''	5,300 250,400	9,466 126,338	24,624 1,544,700	Total Calif.	L	149,600	139,287	663,908		
Ocean perch: Maine Boston Gloucester Total ocean per	4 mos. 5 '' 5 ''	19,700 1,600 16,500	21,146 1,085 24,977 47,208	2,625	Rhode Island, Middl Atlantic, Chesapea South Atlantic, and Gulf States (menhaden only) Alaska (halibut 5/)	ke, l 5 mos.	250,400 6,100	12 6, 338 4,431	1,540,867 19,814		
Scallops, sea (meats		6,100	5,513		Total all above		758,800		3,875,536		
Shrimp (heads-on): South Atl. & Gulf.	5 "	34,700	43,409	195,808	Others not liste		6/	6/	840,464		
Oregon Squid, Calif Tuna, Calif	4 '' 5 '' 5 ''	9,700 109,200	213 2,400 104,236	4,864	Grand total		<u>6</u> /	<u>6</u> /	4,716,000		
Whiting: Maine Boston Gloucester Total whiting Total all above	4 mos. 5 '' 5 ''	39 2,500 2,539 557,493	1 49 5,640 5,690 450,163	23,577 596 58,927 83,100 2,789,038	1/Preliminary. 2/Landed weight, 3/Excluding menhad 4/Includes catch of tuna, and squid 5/Dressed weight, 6/Data not available Note: Data principa as landed except for of meats only.	anchovies, c. ally repres	ent weight	of fish an	d sh ellf ish		
Others (not listed)		201,307		1,926,962			···				
Grand total 1/Preliminary, 2/	Dressed w	758,800 eight. 3/E	648,521 Excluding	4,716,000 menhaden.							

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during May 1959 decreased by 8.3 percent in quantity and 0.4 percent in value as compared with April 1959. The decrease was due primarily to lower imports of groundfish fillets (down 3.0 million pounds) and frozen albacore and other tuna (down 6.8 million pounds), and to a lesser degree, a decrease in the imports of canned tuna in brine and canned salmon. The decrease was partly offset by a 2.1-million-pound increase in the imports of lobster and spiny lobster.

United States Foreign Trade in Edible Fishery Products, May 1959 with Comparisons									
		Quan			Valu	e			
Item	M	lay	Year	M	ay	Year			
	1959	1958	1958	1959	1958	1958			
	(Mill	ion of	Lbs.)	(Mi	llions	of \$)			
Imports:			i .	1	1	1 1			
Fish & shellfish:									
Fresh, frozen, &					ĺ				
processed 1/	82.5	72.4	956.8	25.8	22.3	278.4			
Exports:									
Fish & shellfish:			1						
Processed only 1		ļ		Į.					
(excluding fresh &									
frozen)	5.2	1.4	41.2	1.2	0.3	15.6			
	1/Includes pastes, sauces, clam chowder and juice, and								
other specialties.									

Compared with May 1958, the imports in May this year were up by 13.9 percent in quantity and 15.7 percent in value due to higher imports of frozen tuna other than albacore (up 7.6 million pounds) and frozen shrimp (up 2.6 million pounds). Compensating, in part, for the increases was a drop of about 2.0 million pounds in the imports of fillets other than groundfish and canned salmon (down 1.1 million pounds).

United States exports of processed fish and shellfish in May 1959 were about unchanged in quantity, but were 9.1 percent higher in value as compared with April 1959. Compared with the same month in 1958, the exports this May were higher by 266.9 percent in quantity and 300.0 percent in value. The higher exports in May this year were due to increased exports of canned California sardines and canned salmon.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA AS OF JULY 4: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the $12\frac{1}{2}$ -percent rate of duty is 52,372,574 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports for January 1-July 4, 1959, a-mounted to 21,992,914 pounds, according to data compiled by the Bureau of Customs. For January 1-July 5, 1958, a total of 20,407,245 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.

* * * * *

GROUNDFISH FILLET IMPORTS, JUNE 1959: Imports of groundfish (including ocean perch) fillets and blocks into the United States amounted to 9.3 million pounds—a drop of 1.2 million pounds (11 percent) as compared with the same month of 1958. As a supplier, Canada led all other countries with 5.8 million pounds—a decline of 2.5 million pounds as compared with the corresponding month of last year. Iceland was second with 1.4 million pounds—839,000 pounds greater than in June 1958. Denmark followed with 1.3 million pounds (up 121,000 pounds).

During the first six months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets (including blocks) amounted to 83.9 million pounds. Compared with the first six months of 1958, this was an increase of 16.1 million pounds, or 24 percent. Canada (33.5 million pounds) supplied 40 percent of the six months total. Imports from Iceland (27.8 million pounds) made up 33 percent of the total, while Denmark (10.4 million pounds) and Norway (8.6 million pounds) supplied 12 and 10 percent, respectively. The remaining 5 percent was supplied by West Germany, Miquelon and St. Pierre, the Netherlands, Greenland, the United Kingdom, Ireland, and Japan. Note: See Chart 7 of this issue.

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U. S. Production of Fish Sticks and Portions, April-June 1959

The United States production of fish sticks in the second quarter of 1959 was 14.1 million pounds and fish portions 8.3 million pounds. This was an increase of 283,000 pounds, or 2 percent for fish sticks and 3.1 million pounds, or 59 percent, for portions as compared with the same quarter of last year.

Table 1 - U. S. Production of Fish Sticks by Months, April-June 19591/									
Month	Month Cooked Raw Total								
	(1	,000 Lb	s.)						
April	4,591	362	4,953						
May	4,308	313	4,621						
June	4,222	273	4,495						
Total 2nd quarter 1959	13, 121	948	14,069						
Total 2nd quarter 1958	12,288	1,498	13,786						
Total first 6 months 1959	29,246		32,401						
Total first 6 months 1958 27,911 2,797 30,708									
1/Preliminary.									

Table 2 - U. S. Production of Fish Sticks by Areas, April-June 1958 and 1959									
Area	1959	1/	1958	32/					
	No.	1,000	No.	1,000					
	of Firms	Lbs.	of Firms	Lbs.					
Atlantic Coast States .	22	12, 185	22	11,452					
Interior and Gulf States	5	994	3	1, 173					
Pacific Coast States	9	890	11	1, 161					
Total	36	14,069	36	13,786					
1/Preliminary.									
2/Revised.									

with the same period of 1958, this was an increase of 61 percent in breaded portions and 36 percent in unbreaded portions.

The Atlantic Coast was the principal area for the production of fish sticks with 12.2 million pounds, while the inland, Gulf, and Pacific Coast States led in the production of fish portions.

During the first six months of 1959, a total of 32.4 million pounds of fish sticks was produced--an increase of 6 percent as compared with the corresponding period of 1958. Fish portions (17.2 million pounds) were 73 percent greater than in the same six-months period of last year.

Table 3 - U. S. Production of Fish Sticks, by Months, 1955-1959									
Month	19591/	19582/	1957	1956	1955				
January February March April May June July September October November December Total	6,316 6,394 5,622 4,953 4,621 4,495		,000 Lbs. 4,261 5,246 5,147 4,492 3,380 3,522 3,821 4,643 4,861 5,162 4,579 4,014	4,862 5,323 6,082 3,771 3,873 3,580 3,153 4,166 4,085 5,063 4,585	5,345 5,794 7,205 5,953 4,879 5,392 4,340 4,520 4,535 5,261 4,946 4,876				
1/Preliminary. 2/Revised.									

Table 4 - U. S. Production of Fish Por	tions by I	Months a	and Type,	April-June	19591/
Month	E	Breaded		Unbreaded	
WOIGH	Cooked	Raw	Total	Unbreaded	Iotai
		(1,000 Lb	s.)	
April	398	1,993	2,391	217	2,608
May	228	2,098	2,326	257	2,583
June	323	2,583	2,906	231	3,137
Total 2nd quarter 1959	949	6,674	7,623	705	8,328
Total 2nd quarter 1958	800	3,933	4,733	517	5,250
Total first 6 months 1959	2,631	13,190	15,821	1,371	17,192
Total first 6 months 1958	1,718	7,245	8,963	985	9,948
1/Preliminary.					

Cooked fish sticks (13.1 million pounds) made up 93 percent of the fish-stick production. The remaining 7 percent (948,000 pounds) consisted of raw fish sticks. A total of 7.6 million pounds of breaded fish portions (of which 6.7 million pounds were raw) and 0.7 million pounds of unbreaded portions were processed during the second quarter of 1959. Compared

Table 5 - U. S. Production of Fish Portions by Areas, April-June 1958 and 1959									
Area 1959 ¹ / 1958									
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.					
Atlantic Coast States .	21	3,808	18	3,028					
Inland, Gulf, and Pacific Coast States .	11	4,520	7	2,222					
Total 32 8,328 25 5,250									
1/Preliminary.									

Table 6 - U. S. Production of Fish						
Portions by Month	ns, 1958-	1959				
Month	19591/	1958				
January	2,665	1,973				
February	2,996	1,254				
March	3,203	1,471				
April	2,608	2,268				
May	2,583	1,478				
June	3,137	1,504				
July	-	2,161				
August	-	1,516				
September	-	1,566				
October	-	2,560				
November	-	1,979				
December	-	2,060				
Total	-	21,790				
1/Preliminary.						



Vessels

MARKET FOR UNITED STATES-BUILT FISHING VESSELS IN MEXICO AND PERU POOR: The market for United States-built fishing vessels in Mexico and Peru (the expansion of the fisheries in both countries has been rapid in recent years) is practically non-existent. Prior to mid-1958 there was

Mexico: The largest group of wooden shrimp vessels purchased in the United States the spring and early summer of 1958 were 58 feet in length and cost about US\$33,000 each, plus an additional cost of \$2,400 for delivery to Salina Cruz. Comparable vessels built in Mexico now cost between \$34,000-\$36,000, however, the price of Mexican-built shrimp vessels is rising.

The tendency in Mexico is towards steel rather than wooden shrimp vessels. The principal reason for this is that Mexican lumber is not kiln-dried and imported lumber, unless in a free port, is expensive. One owner, who is having two 56-foot wooden vessels constructed in a free port from imported United States pine lumber, estimates that his cost for fully-equipped double-rig boats (with the exception of sonic depth finders) will be about \$32,000. The boats will have 120 hp. Diesel engines and the electric plant will be gasoline-powered.

The chief reasons given for purchasing shrimp vessels in the United States were:

(1) The reliability and rapidity of delivery dates of United States as compared to Mexican shipyards. United States de-

Table 1 - Costs and I	Table 1 - Costs and Details of Construction of Steel Shrimp Trawlers in Mexico										
Item	Company A	Company A	Company B	Company C	Company C						
Cost to Buyer	\$38,800	\$40,800	\$45,200	\$40,000	\$44,000						
Length	581	62'	651	55'10''	601						
Beam	161	17'6''	18'6''	NS.	NS.						
Fuel capacity	3,435 gals.	4,490 gals.	5,547 gals.	NS.	NS.						
Oil capacity	53 gals.	53 gals.	66 gals.	NS.	NS.						
Fresh water capacity	792 gals.	925 gals.	1,320 gals.	NS.	NS.						
Hold capacity $\frac{1}{2}$	21 M.T.	30 M.T.	22-24 M.T.	NS.	NS.						
Motor	150 hp.	182 hp.	182 hp.	100 hp.	10 hp.						
Delivery time	NS.	NS.	7 mos.	NS.	NS.						
Penalty clause	None	None	620 daily	NS.	NS.						
1/Capacity in terms of crushed ice. NSNot specified.											

a good market for United States-built shrimp trawlers in Mexico, but at present, due to vessel-building subsidies and a protective policy for Mexican shipyards, this market came to an end in the last half of 1958. Peru is also capable of building vessels to add to or replace its present fleet.

livery dates were from 3-4 months where as the Mexican deliveries at the time those orders were placed, were about one year away and the Mexican purchasers wanted their vessels as soon as possible.

(2) Of less importance was the fact that better lumber could be secured in the United States. Prices on steel vessels built in Mexico vary somewhat between companies, and the type of motor also causes variation in price. The customary practice is to quote prices of vessels equipped with motor, mast, booms, winch, light plant, radiotelephone, and sonic depth finder (see table).

The vessels of Company C, whose prices run higher than the others, are equipped with Diesel electric plants whereas the other shipyards furnish gasoline-powered motors. This company claims that it is the only one in Mexico that meets the requirements for the highest class set by the American Bureau of Shipping and for this reason vessels from this yard are more costly, but they pay smaller insurance premiums.

One company prefers about 30 percent payment on signing of the contract and within 15 days of this date the purchaser is required to establish sufficient credit to provide for the purchase of the motor, transmission, power take-off, radiotelephone, sonic depth-finder, winch, and whatever other equipment may be specified in the contract. Within 60 days of signing, providing the vessel is ready for sheathing, about 10 percent of the purchase price is to be paid. Within 90 days about another 10 percent, provided the hull is completely sheathed; within 120 days, about another 10 percent, provided the hull is in the water; and on delivery, the remainder which also amounts to about 10 percent of the sales price.

Another shipyard prefers a down payment of about 20 percent; another payment within 30 days to cover the cost of the motor; a payment of about 20 percent when the hull is ready for sheathing; 20 percent when the hull is sheathed and the remainder, which usually runs around 15 percent, when the hull is completed.

There have been no recent purchases of shrimp vessels in the United States due to a decree issued in March of 1958 which makes it difficult to obtain vessels from the United States.

In addition to the above decree the Mexican Government recently granted local shipyards certain subsidies for boats falling within the size range of the usual shrimp boat.

The most recent purchase of vessels, other than shrimp trawlers, was that of two used menhaden seiners for a fishmeal plant, now under construction at Ciudad del Carmen, Campeche. So far as can be determined in recent months, no new fishing vessels have been purchased in the United States for use in Mexico.

Peru: Peruvian fishing-boat construction has been booming owing to increased interest in fish-meal production. Most of the vessels under construction are about 50 feet in length and are equipped for fishing with purse seines for anchovies. It is understood that the sizes of boats being built in Peru are increasing. One source recently reported a 90-foot fishing boat under construction.

No information is available as to any recent Peruvian purchases of fishing vessels from the United States. It is believed that very few, if any, new fishing vessels have been purchased recently in the United States for use in Peru. Peru is constructing practically all, if not all, of her own fishing vessels.



Virginia

BIOLOGISTS EXPERIMENT WITH MESH SIZE OF CRAB POTS: The shell-fish biologists of the Virginia Fisheries Laboratory, Gloucester Point, are trying to find a crab pot that will catch only 5-inch wide legal-size blue crabs, and will allow smaller crabs to escape. The biologists have constructed dozens of pots from wire of different mesh openings, and are comparing the catches of the pots.

The pot that has been most efficient will catch the same number of legal crabs as the pot now used by Virginia's crab fishermen, but catches only one-half as many under-size crabs.

The Virginia biologists are also tagging hundreds of blue crabs in the York River to learn the direction and speed of

movement of crabs, and to obtain estimates of the amount of the commercial fishing effort.

Whaling

PACIFIC COAST WHALING SEASON OPEN: The 1959 season for United States whaling began May 1. For six months after that date, in accordance with regulations issued by the U. S. Department of the Interior, the taking of baleen whales is permitted from licensed land stations; sperm whales may be taken during eight months beginning April 1.

As in 1958, the only United States whaling companies licensed are two California companies which take whales just outside San Francisco. These companies use a total of five catcher vessels. Two secondary stations assist in the preparation of products. The 261 whales taken in 1958 produced meat, oil, and meal valued at nearly one million dollars.



Wholesale Prices, July 1959

There was practically no change in wholesale prices of fishery products from June to July. But prices this July were substantially lower than in 1958 principally because of a sharp drop in shrimp prices. The July 1959 edible fish and shellfish (fresh, frozen, and canned) wholesale price index was down 0.4 percent from June and lower by 6.2 percent from the same month in 1958.

Because of the continuing shortage of large haddock and very light supplies of certain fresh-water fish (yellow pike and Lake Superior whitefish), the price index this July for the drawn, dressed, and whole finfish subgroup was up 8.3 percent from June. Price declines from June to July of 1.5 percent for fresh western halibut, 2.6 percent for large and medium king salmon, and 9.3 percent for round Great Lakes whitefish at New York City failed to offset the higher prices for the other items in the subgroup. The wholesale price index for the subgroup this July as compared with July a year ago was higher by 6.1 percent due to higher prices for all the subgroup items except fresh West Coast halibut prices which dropped 16.3 percent.

The fresh processed fish and shellfish subgroup whole-sale price index dropped about 10 percent from June to July this year. Although fresh haddock fillets at Boston were up by 7.9 percent and shucked oysters up 2.2 percent, a 21.9-percent drop in fresh shrimp prices at New York City from June to July more than offset the increases. About the same situation accounted for the 17.7 percent decline in wholesale prices for this subgroup from July a year ago to this July. Fresh shrimp prices in July this year were down 33 percent when compared with the same month in 1958.



Box of iced carp on Fulton Market, Chicago, Ill.

From June to July this year, a decrease of 2 cents a pound in the average price of 26-30 count frozen white and brown shrimp at Chicago was responsible for the 1.2 percent decline in the frozen processed fish and shellfish subgroup index. Wholesale prices for frozen fillets were unchanged during this period. The drop (11.3 percent) in the wholesale price index from July of last year to this July was even more pronounced due mostly to a sharp drop of 19.4 percent in frozen shrimp prices. Average white and brown wholesale frozen shrimp prices (26-30 count) in mid-July this year were down 17 cents a pound from the price of 94 cents a pound reported in July 1958, but last year shrimp supplies and stocks were comparatively light.

The canned fish wholesale price index in July 1959 was fractionally higher when compared with the preceding month due only to an increase of 3-cents a case for the New York City delivered price of Maine sardines. This increase was due to higher transportation charges from the Maine cannery plants to New York City. But the canned fish index this July was lower by 4.0 percent from July a year ago. Canned tuna prices dropped 7,3 percent and canned California sardine prices dropped 35.2 percent from July 1958 to July 1959 because of liberal stocks. These declines were partially offset by higher canned salmon and canned Maine sardine prices. At the end of July this year most of California bait boat tuna fleet was still tied-up in port due to a dispute over ex-vessel prices. The Maine sardine pack in July picked up sharply from June when packing for this season actually started, but the two-months pack total was still below the pack as of July 31, 1958. Stocks of California sardines on hand were all from the August 1-December 31, 1958, packing season. California sardines in tomato sauce are almost sold out, but there is still a good supply of sardines packed natural. Although the sardine fishing season officially opened in Central California on August 1, the 1959 California sardine packing season was unlikely to start because of the lack of agreement between the fishermen and the canners on the ex-vessel price for sardines. The canned salmon pack as of the end of July 1959 was considerably less than last year and indications point to a very light supply for the 1959/60 marketing season.

Table 1 - Wholesale Average Prices and Indexe	s for Edible F	ish a r	d Shell	fish, July	1959 with	Compar	isons	
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ (\$)		Indexes (1947-49=100)			
			July 1959	June 1959	July 1959	June 1959	May 1959	July 1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)		• • •			123.0	123.5	121.7	131.2
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, Ige. & med., drsd., fresh or froz. Whitefish,L. Superior, drawn, fresh Whitefish,L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh		1b. 1b. 1b. 1b. 1b.		.11 .34 .78 .57 .88	139.0 160.2 169.5 103.6 171.3 151.2 159.8 190.0	139,9 147,9 109,1 105,2 175,8 140,1 177,0 158,3	138.1 145.5 97.0 107.0 174.1 192.1 192.1 140.7	150.0 151.0 131.6 123.8 169.1 132.6 126.4 164.1
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb. tins Shrimp, Ige. (26-30 count), headless, fresh Oysters, shucked, standards	Boston New York Norfolk	lb. lb. gal.	.41 .66 5.88	.38 .85 5.75	139.5 104.3 145.4	129.3 133.5 142.3	117.4 136.7 139.2	134.4 156.4 142.3
Processed, Frozen (Fish & Shellfish): Fillets: Flounder, skinless, 1-lb. pkg	Boston Boston Boston Chicago	lb. lb. lb. lb.	.39 .34 .28	.39 .34 .28	120.9 102.1 105.2 112.8 118.4	122.4 102.1 105.2 112.8 121.1	119.8 100.8 103.6 112.8 117.6	136.3 103.4 105.2 114.8 145.1
Canned Fishery Products: Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, 1t. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	Seattle Los Angeles Los Angeles New York	cs.	23.50 10.80 7.25 8.25	10.80	100.5 122.6 77.9 85.1 87.8	100,4 122.6 77.9 83.9 87.5	98.6 117.4 77.9 83.9 88.8	104.6 120.0 84.0 131.3

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



KILLING WHALES WITH CARBON DIOXIDE SHELLS

A new Norwegian invention for hunting whales using carbon dioxide (CO₂) will be tried out in practice in whale hunting off Iceland. The new idea, experimented with by a Norwegian engineer, is that when the harpoon hits the whale the shell releases 2.5 $\rm m^3$ (88 cu.ft.) of CO₂, which spreads through the whale's body and kills it in 2 seconds. It then causes the whale to float to the surface without air having to be pumped into it (Food Manufacture, September 1957).



International

FISHERIES TRADE FAIR

TO BE HELD IN COPENHAGEN, SEPTEMBER 25-OCTOBER 4, 1959:

The 3rd International Fisheries Trade Fair, scheduled to take place in Copenhagen, Denmark, between September 25 and October 4, 1959, will be on a larger scale than its two predecessors (in 1956 and 1957), according to the sponsoring organization, Universal Fair and Exhibition Service.

The fair is to take place in the Forum exhibition hall, where 90 percent of the available floor space has already been booked. Exhibitors from 16 countries will participate.

On display will be all kinds of equipment used in the fishing and fish processing industries. New inventions and techniques developed since the 1957 Fair will be prominently featured. Particular attention will be given to fishing vessels, and several boat yards will be represented, showing the most recent developments within this field, especially with regard to steel cutters.

The sponsors expect that the number of visitors to this year's Fair will exceed that of the 1957 Fair, reported to have been about 60,000.

FOOD AND AGRICULTURE ORGANIZATION

FISHERY COOPERATIVES MEETING HELD AT NAPLES, ITALY:

The first Technical Meeting on Fishery Cooperatives, convened jointly by the Food and Agriculture Organization (FAO), Rome, Italy, and the International Labor Organization (ILO), was officially opened at Naples on May 12 by the Italian

Minister of the Merchant Marine. The Secretary-General of the Italian Cooperative Confederation (CCI) was elected chairman of the Meeting.

In his opening speech, the Italian Minister said that fishermen must organize

themselves into cooperatives in order to increase their technical and financial means, must adopt new systems to harvest the biological resources of the sea, and must rationalize their



activities, reduce costs, and increase their competitive position in the fish market.

"This Conference should make clear the moral, technical, economic, and social advantages of fishery cooperatives," he said.

The Director of FAO's Fisheries Division said it was the first international meeting of the kind, and "though most of you have clearly similar interests in the development of fishermen's cooperatives, few amongst you have ever acted before.

"In planning our work," he said, "we should bear in mind also that the result of our discussions will be of interest not only to ourselves, but particularly to many of our friends in less-developed countries who are confronted with the urgent problems of developing their fisheries."

The chairman said that, particularly in the field of fisheries, the only possible solution to problems confronting producers and consumers is the establishment of cooperatives.

"I hope that governments will increase their support to the cooperatives without

endangering their autonomy and independence," he concluded.

The ILO representative said that ILO and FAO are concerned both with problems of fishermen and questions concerning cooperatives.

"The important thing, however, is that a start will have been made, and since the cooperative movement is not a static edifice but a living organism, the question which we shall be discussing will almost certainly prove to be of perennial interest."

Seventy-five delegates from 18 countries and observers from several international organizations attended the nineday meeting. A number of study tours were on the agenda, as well as visits to Cooperative Societies concerned with marine fishing and shellfish cultivation, situated in the Gulf of Naples. Countries and organizations represented: Belgium, Canada, France, Western Germany, Greece, Italy, Japan, the Netherlands, Norway, Poland, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States of America, Viet-Nam, Yugoslavia; ICA, International Federation of Agricultural Producers, the Indo-Pacific Fisheries Council, the General Fisheries Council for the Mediterranean.

INTERNATIONAL LABOR ORGANIZATION

COMMERCIAL FISHERMEN LABOR INSTRUMENTS ADOPTED BY CONFERENCE:

The International Labor Organization at its 43rd conference in Geneva, on June 26 adopted three instruments pertaining to commercial fishermen. By a majority vote the Conference adopted the following: (1) the minimum age for admission of fishermen to employment to be 15 years; (2) medical examinations for fishermen-annually for those under 21 years of age and periodically for those over 21 years; and (3) articles of agreement are to be required between fishermen and vessel owners.

The United States delegation included George C. Lodge, Assistant Secretary of

Labor, Cola G. Parker, Chairman of the Finance Committee, National Association of Manufacturers as employer's delegate, and Rudolph Faupl, International Representative, International Association of Machinists, as worker's delegate. Advisor on fisheries to Faupl was George Johansen, Secretary-Treasurer, Alaska Fishermen's Union, and fishery advisor to Parker was Charles E. Jackson, General Manager, National Fisheries Institute.

Note: Also see Commercial Fisheries Review, November 1958, p. 61.

INTERNATIONAL OCEANOGRAPHIC CONGRESS

MEETS IN NEW YORK AUGUST 30 TO SEPTEMBER 12:

The International Oceanographic Congress meeting was held from August 30 to September 12, 1959, at the United Nations Building in New York

The purpose of the Congress was to provide a common meeting ground for all sciences concerned with the oceans and the organisms contained in them. It was devoted to the fundamentals of the marine sciences rather than to their applications.

The Congress was centered around five symposia on the oceans—the history, the boundaries, the deep sea, dymanics of organic and inorganic substances, and the marine life regime. Each topic was considered for two consecutive days with three lectures each morning. The afternoon sessions were organized around the topics of the morning lectures, either as roundtable discussions, seminars, or a series of papers.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

FIRST SEASON IN AREAS 2 AND 1B CLOSED:

The International Pacific Halibut Commission announced the closure of the first season in Areas 2 and 1B to halibut fishing effective at 6 a.m. (P.S.T.) July 8, 1959, until the beginning of the second fishing season in these areas. The Commission estimated that the 26.5-million-pound limit set for Area 2 would have been caught by that date. Area 1B, which has no catch limit, was also closed when the quota for Area 2 was attained. The Commission announced the closure on June 29, 1959.

The official opening date for all halibut fishing in the North Pacific regulatory area this year was May 1 at 6:00 a.m. (P.S.T.), except that fishing in Area 3B commenced on April 1, 1959.

International

Areas 2 and 1B this year were open to halibut fishing for 68 days as compared with 59 days in 1958 and 47 days in 1957. These same areas were fished for 38 days in 1956 (fishing started May 20), 24 days in 1955, 21 days in 1954, and 24 days in 1953.

The longer period required to catch the Area 2 catch limit this season is attributed to (1) lighter catches and fewer vessels fishing Area 2, and (2) the continuation of the 8-day lay-over between trips initiated in 1956.

The second fishing season in Areas 2 and 1B is scheduled to commence at 6:00 a.m. (P.S.T.)



A trip of dressed halibut on ice prior to freezing at Ketchikan, Alaska.

August 22, for a period of 7 days without a catch limit, except that in Area 2 the Cape Scott and Goose Islands grounds in Queen Charlotte Sound and the inside waters of southeastern Alaska shall be closed to halibut fishing during the second season. Thereafter, Areas 2 and 1B are closed to halibut fishing until the commencement of the halibut fishing season in 1960.

* * * * *

FISHING IN AREA 3A ENDED AUGUST 1, 1959:

The end of fishing in Pacific halibut Area 3A took place at 6 a.m. (P. S. T.) on August 1, 1959. The International Pacific Halibut Commission made the announcement on July 13, 1959, since it estimated that by August 1 the catch limit of 30 million pounds for Area 3A would have been reached. The area 3A closure this year is 30 days sooner than in 1958 when fishing ended on August 31. In 1957 fishing in Area 3A stopped on September 22.

The Commission at the same time it announced the closure of Area 3A also announced that halibut fishing in Areas 1A and 3B will end at 6:00 a.m. (P. S. T.) on October 16. Because the Area 3A fishing season ended so early this year, it is believed that more than the usual number of halibut vessels will fish the Bering Sea or Area 3B this fall.

After the end of fishing in Areas 1A and 3B, those Pacific halibut areas will be closed to fishing until the reopening in 1960.

Area 1A includes the waters south of Heceta Head, Oregon; Area 3A, the waters off the coast of Alaska between Cape Spencer and the Shumagin Islands; Area 3B, the waters west of Shumagin Islands and in the Bering Sea; Area 2, the waters between Willapa Bay and Cape Spencer, Alaska; Area 1B, the waters between Willapa Bay and Heceta Head.

This year Area 3A was open to fishing for 92 days—27 days less than the 119 days in 1958. In 1957 the area was open to fishing for 144 days (the longest season for the area since 1945 when the area was open to fishing for 147 days). Between 1945 and 1955 the trend had been towards a shorter season, but then the trend reversed itself and through 1957 the seasons were longer. However, beginning in 1958 the trend was reversed again and the seasons have become shorter. Area 3A was open for halibut fishing for 104 days in 1956, 81 days in 1955, 58 days in 1954, 52 days (shorter on record) in 1953, 60 days in 1952, 56 days in 1951, 66 days in 1950, 73 days in 1949, and 72 days in 1948.

Under authority of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, this year's regulations became effective March 31, 1959.

TRADE AGREEMENTS

SWEDISH-NORWEGIAN TRADE AGREEMENT FOR 1959 INCLUDES FISHERY PRODUCTS:

The Swedish-Norwegian annual trade protocol for the calendar year 1959 was signed in Stockholm on March 21. Under the Protocol, right has been reserved to convene discussions in the event the internal measures taken by the two contracting parties tend noticeably to obstruct mutual trade in fish and fish products.

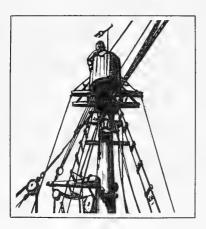
In an exchange of letters, the Norwegians suggested the abolition of Swedish import restrictions on salted fat herring; found in Sweden's method of determining its fish demand to be unfavorable; pointed out the obstructive effect of a 45-ore (US\$0.09) Swedish import fee, per kilogram (2.2) lbs.), on Norwegian exports of fresh and frozen filleted fish; and recommended removal of these restrictions. The Norwegians further pointed out that the new Swedish Customs Tariff, effective January 1, 1959, entailed considerable increases in import duties on certain items. The Swedes, on their part, called attention to a marked decline in their mackerel exports to Norway after the imports of this fish had been made subject to import license requirements beginning June 10, 1958. Delegates agreed to refer the respective points to their Governments.

The list of Swedish exports to Norway attached to the Protocol did not include any fishery products. Among the items listed by value and quantity for export to Sweden from Norway were lobsters. Fresh fish and herring, frozen and filleted fish, marine oils and fatty acids, and fish meal, and miscellaneous items are subject to supply and demand. A special item in the Norwegian list is salted, sugared-and-salted, and spiced herring for which Swedish import licenses will be granted within the scope of an over-all nominal annual quota of 14,500 metric tons which may be drawn from Norway, Denmark, Faeroe Islands, Iceland, the Netherlands, and the United Kingdom.

WHALING

QUOTA APPORTIONMENT TALKS END WITHOUT AGREEMENT:

No agreement was reached on the apportionment of the pelagic (deep-sea) whale quota for 1960 Antarctic whaling



at talks held in Tokyo early in June. The countries involved are Japan, Nether-lands, Norway, Russia, and the United Kingdom.

The Managing Director of the Netherlands Whaling Company, after returning from the Tokyo Whaling Conference, mentioned that the Dutch are now prepared to keep the Bloemendael, a tanker, out of Dutch whaling operations. But they would insist on a minimum quota of 1,200 blue-whale units or 8 percent of the total catch quota. (In the past the Dutch have

caught about 4.6 percent of the total quota.) He also mentioned that the sale of the whaling factoryship Willem Barendsz has been put off for the time being. The Dutch representative indicated that Norway is prepared to decrease its allocation of whale units somewhat.

The Managing Director also pointed out that the Dutch have proposed raising the whale catch limit of 15,000 blue-whale units to 16,000 or 16,500. This proposal was based on scientific research conducted by an Amsterdam professor who found that such an increase is justified while at the same time conserving the whale supply. The Dutch Managing Director is agreeable to the proposals of all of the whaling countries with the exception of the article limiting each country to a certain percentage of the 15,000 whale units.

Because of failure to agree on the allocation of the quota between the five countries involved at the end of 1958, Japan, Holland, and Norway announced their conditional withdrawal from the International Whaling Convention. Withdrawals were scheduled to become effective by June 30, 1959, unless agreement was reached in London at the meeting of the Whaling Commission on June 22-27. (United States Consulate, Amsterdam, report of June 5.)

* * * * *

ELEVENTH ANNUAL
MEETING OF INTERNATIONAL
WHALING COMMISSION:

The Eleventh Meeting of the International Whaling Commission was held in London, June 22-31, 1959. The Contracting Governments represented at the meeting were Australia, Canada, Denmark, France, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, South Africa, Sweden, U.S.S.R., the United Kingdom, and the United States. In addition, there were observers from the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, Argentina, and Portugal.

In welcoming the Commission, the British Minister of Agriculture, Fisheries, and Food stressed the importance

of the whaling industry, and particularly of Antarctic whaling, to the world economy. Great efforts in aid of conservation had been made since the Commission began its work, and although there were many difficulties to be met none denied that control was essential.

Throughout its proceedings the Commission was aware that the five Anarctic pelagic whaling countries (Japan, the Netherlands, Norway, U.S.S.R., and the United Kingdom) had been continuing separate talks with a view to limiting the numbers of their fleets and allocating the total permitted Antarctic catch between them. The Commission has the power to protect particular species, to declare open and closed seasons and areas, prescribe minimum size-limits for each species caught, to determine the time, methods, and intensity of whaling (including the maximum catch of whales to be taken in any one season), but is not able to allocate catch quotas to the different countries or restrict the number of pelagic expeditions.

In recent years the view has been widely held that the total number of whale factoryships and catchers had become too large and expensive to make economic catches within the ceiling authorized by the Commission as the limit which the Antarctic stocks of whales could support. Without some agreement which would enable the Antarctic whaling countries to conduct their operations in a more rational and economic manner, it was considered impossible for the fleets of some countries to operate profitably.

Three of the Antarctic pelagic whaling countries (Japan, the Netherlands, and Norway) had given notice of withdrawal from the Convention to take effect from June 30, 1959. The Commission was informed that the Antarctic pelagic whaling countries had been unable to reach a generally-acceptable agreement on the allocation of the authorized catch. The Commission expressed concern at the effect upon the whale stocks if the Convention was not adhered to and urged that all countries should remain party to the Convention while making further efforts to reach agreement. However, the Neth-

erlands and Norway informed the Commission on June 30 that their notices would become effective. Nevertheless, both those countries undertook to continue to abide by all the Commission's regulations excepting the catch limit and, in the case of the Netherlands, the length of the whaling season. The Japanese Government decided to rescind its notice of withdrawal.

The main aims of the Convention are given effect in a document attached to it known as the Schedule and during their proceedings the Commission took several decisions affecting the Schedule.

The first of these concerned the maximum permissible catch of whales for the Antarctic season 1959/60 and here it was agreed that there should be no change and that the figure should remain at 15,000 blue-whale units. (A blue-whale unit is I blue whale, or 2 fin whales, or $2\frac{1}{2}$ humpback whales, or 6 sei whales.)

An area of the southern hemisphere south of latitude 40° S. and between meridians 70° W. and 160° W., formerly a sanctuary for baleen whales but which had been open for whaling for the last four years, was declared open for another three years.

The Antarctic season for catching fin and sei whales was formerly from January 7 to April 7, but the Commission considered it desirable to advance the commencement of season 1959/60 to December 28, 1959.

The season for the taking of humpback whales in the Antarctic was changed from February 1-4 to four days commencing January 20.

The blue-whale stocks in the North Atlantic are considered to be too low for exploitation at present and this species has been scheduled for complete protection since 1954. Consideration of the condition of the blue-whale stock resulted in a recommendation that this protection should be continued for five years ending on February 26, 1965.

At the present time enforcement of the terms of the Convention on factoryships in the Antarctic is based on the presence of inspectors of the country

whose flag the ship flies. Proposals were before the Commission that these ships should each carry an observer of some other nationality than that of the flag country. The proposal was agreed in principle and it was decided that the detailed working out of a plan would be left to Japan, U.S.S.R., and the United Kingdom, who would consult with the Netherlands and Norway and endeavour to bring a scheme before the Commission as soon as possible.

The Commission considered the question of the humane slaughter of whales. It was agreed that a small subcommittee should be appointed to examine the advantages and disadvantages of the various methods of killing whales with a view to recommending a program of research and development for the improvement of existing methods and the possible development of new ones.

The Commission took note that 20 factoryships operating in the Antarctic took a total of nearly 31,000 baleen whales

(equivalent to 15,300 blue-whale units) during a season lasting from January 7 to March 16, 1959, and 2,052,000 barrels of whale and sperm oil were produced. The catch of blue whales--the largest species--fell from about 1,700 in the 1957/58 season to about 1.200 in the 1958/59 season. The number of fin whales taken was 25,700, compared with 25,100 in the previous year. Some 2,400 humpback whales, about 2,000 more than last year, were taken during the 4-day season for this species. The catch of sperm whales was 5,400, against 6,300 in the previous year. Antarctic land stations took 816 blue-whale units yielding 103,000 barrels of oil.

Fifty-two land stations and three floating factories operated outside the Antarctic during 1958. Some 24,000 whales were taken compared with 6,000 in 1946, the increase being mainly due to the larger catch of sperm whales. The production of whale oil amounted to some 315,000 barrels (at 6 barrels to the ton), about the same as in 1957, but production of sperm oil increased by about 30,000 barrels to some 402,000 barrels.



Australia

FROZEN SHRIMP EXPORTS, 1956/57-1957/58:

During the fiscal year 1957/58, frozen shrimp exports (raw heads on and heads off and cooked heads off) from Australia totaled 299,522 pounds, a decrease of 17,865 pounds, or 6 percent, as compared with fiscal year 1956/57. Frozen raw headless shrimp made up most of the exports.

The United States received 170,193 pounds, or 57 percent of the 1957/58 total exports, and Honolulu was second with 96,350 pounds, or 32 percent. Nearly all of the shrimp exported to the United States was frozen raw headless.

Frozen Shrimp Exports from Australia, 1956/57-1957/58									
		Raw S	hrimp		Cooked		Total		
	Heads On Heads Off		Heads Off		Total				
	1957/58	1956/57	1957/58	1956/57	1957/58	1956/57	1957/58	1956/57	
				(Por	ınds)				
By State of Landing:)					1		
New South Whales	100	2,747	5,100	21,545	10,229	27, 154	15,429	51,446	
Queensland	2,250	1,446	266,300	198, 280	15,543	66,215	284,093	265,941	
Tasmania		-					-		
Total	2,350	4, 193	271,400	219,825	25,772	93,369	299,522	317,387	
By Country of Destination:									
United States	-	_	170,050	128,885	143	-	170, 193	128,885	
Honolulu (Hawaii)	2,050	-	94,300	83, 265	-	20, 190	96, 350	103, 455	
Other Countries	300	4, 193	7,050	7,675	25,629	73, 179	32,979	85,047	
Total	2,350	4, 193	271,400	219,825	25,772	93,369	299,522	317,387	
Source: Department of Primary	Industry, F	isheries Div	ision.						
Note: Fiscal yearJuly 1-June	30.								

Belgian Congo

CANNED SARDINE MARKET:

Summary: It is estimated by the major wholesalers and retailers in Leopoldville, that about 95 percent of the sardines and pilchards (California-type sardines) imported into the Belgian Congo and Ruanda-Urundi are sold to Africans. The main sales consideration for this market is simply price. Most of the pilchards are sold in the tall one-pound can, natural pack, at 11-13 francs (22 to 26 U. S. cents) retail. Nearly all sardines are sold in the 1/4-club (4.5 ounce can), packed in peanut oil, for 5-6 francs (10 to 12 U.S. cents).

The pilchards are imported mainly from South Africa, and the sardines imported from Portugal. A case of South African pilchards, delivered at the Belgian Congo port of Matadi, sells wholesale at US\$1 or more below comparable packs of California pilchards. A case of Portuguese sardines sells c.i.f. Matadi at the same price, or less than similar United States packs f.o.b. Los Angeles. Unless the prices for canned California pilchard are lowered to competitive levels, there will be but a very limited market for them in the Belgian Congo.

Imports: Total sardine imports in 1958 were about 2,2 million pounds valued at 21,555,526 francs (US\$431,111). By far the largest sardine imports (about 1.6 million pounds) were Portuguese. These amounted to 15,411,401 francs (\$308,228) in value, and constituted about 71 percent of the total. Imports of sardines from the United States in 1958 amounted to only 41,000 pounds, valued at US\$7,000.

There were 1.4 million pounds of pilchards imported in 1958 with a value of 7,785,878 francs (about \$155,717). South African pilchards made up 86 percent of the total pilchard imports, while those from the United States were but .01 percent.

Stocks: Sardines and pilchards are well-established market items in the Belgian Congo, with a very slow growth in sales. Wholesalers have a clear idea of their market needs, and hold their inventories down to the minimum. They buy 1-3 months' stock at a time, tailoring the amounts according to discounts and to quantities offering the lowest transportation costs. There is little stockpiling as local storage is expensive, the demand is steady, and there is a buyer's market.

The size of inventories seldom affects local prices. Occasionally, one or more of the largest dealers may be caught short by a delayed delivery. Sardine and pilchard prices have then run up a little, about one cent on the cheapest sardines and 2-5 cents on natural pack pilchards. It is, however, a rare occurrence. Inventories of United States and Japanese sardines are small, and at times those products may be completely off the local market.

Consumer Preference: The African consumer is very a-ware of brands, faithful to a product which has initially satisfied him, and extremely cost conscious. He will seldom buy pilchards costing more than 11 to 13 francs (about 22 to 26 U.S. cents) a pound can, or sardines in the 4.5 ounce 1/4-club can for more than six francs (12 U.S. cents). The preferred pilchard pack is the tall one-pound natural pack. Tomatosauce packs in one-pound cans are also sold to the Africans, but constitute only a third of the volume of the natural pack. Very few oval cans are sold in the African market because they cost more without any offsetting gain in contents.

The most popular sardine pack among the natives is the 1/4-club can packed in peanut oil. It sells completely stripped, without wrapping, coloring, or imprinted advertising. The only mark on the can is a country-of-origin seal stamped into the metal. Dealers generally agree that the village African prefers peanut oil to olive oil as a pack, and wants thick oil with a good strong smell. The city native likes olive oil, but will seldom pay the higher price for it.

One of the wholesaler-retailers stated that there was some latent African resistance to United States sardines,

The preferences of the European population are very largely a matter of nationality and of buying patterns established prior to residence in the Congo. Each nationality tends to buy the products of its country. Portuguese sardines, however,

are generally esteemed, and are available in a great variety of qualities and prices. Sales of sardines to Europeans are largest for the high-quality Portuguese products, and for French and Dutch brands. Spanish, Japanese, Moroccan, and Yugoslavian sardines or pilchards are available, but their European sales volume is small. There are no United States sardines or pilchards presently being sold on either the European or African market in Leopoldville.

Marketing Problems: There are no major market problems for sardines or pilchards. Dealers are bothered by delays in shipments, and the logistics of bimonthly purchasing, but no more so than for most imported commodities. The main market problem for California sardines or pilchards in the African market is their relatively high price. The competition from South African pilchards appears too strong to permit hope for any extensive sale of California pilchards in the Belgian Congo. Trade officials from South Africa indicate that the wholesale price of a case of South African natural-pack one-pound cans of pilchards could be reduced 50 U.S. cents should the California product be lowered to the present competitive level of \$5.00 to \$5.50 per case c.i.f. Matadi.

Japanese sardines are very competitive in price, but the Belgian Congo Government severely limits Japanese imports. Japan buys little from the Congo, and the Administration's policy is to preserve a balance of payments between the two countries by limiting the sale of Japanese goods. The main competitor for American sardines on the African market is Portugal, which exports a very wide range of qualities to the Congo.

For the European market, the price of United States sardines appears competitive. The American community in Leopoldville, however, is about 150 persons, including children. The other Americans in the Congo, mainly missionaries, are widely scattered. There is no American preference demand of any consequence, and the California pilchards would have to combat other well-established national products in a very limited market.

Prices: The wholesale price of a case of South African pilchards, 48 cans to the case, natural-pack, tall one-pound cans is now 39.5 to 43 shillings (about \$5.60 to \$6.00) c.i.f. Matadi. The tomato-sauce pack is 1-3 shillings (14-42 U.S. cents) more expensive.

The wholesale price of a case of Portuguese sardines, 1/4-club, peanut oil-pack is 300 to 330 francs (\$6.00 to \$6.60) a case (96 cans) c.i.f. Matadi.

Market Outlet: The African market for sardines and pilchards is large, but is showing no sustained growth. Its rate of increase is estimated by local dealers at about five percent a year. As the rate of population growth for Africans is itself 2.5 percent, the actual rate of increase of sardine sales is low. Total import values for both sardines and pilchards were less in 1958 than in 1957, but it seems probable that this was caused by the recession and fall in African buying power.

There is much increased competition from fresh and smoked or salted fish. Their prices are much less than for canned sardines, and local fish is preferred by the native, particularly when smoked. The production of local fish is increasing as the Belgian Congo Government is giving native fishermen every possible assistance, and is teaching villagers to develop fish ponds. Canned sardines and pilchards will face rapidly increasing competition from this source, and also from imports of salted ocean fish.

The immediate marketing potential for California pilchard sales is very slight unless prices are much reduced. The price differential between California sardines and competing products is increased when freight and insurance, estimated at about a dollar a case, are added to the California products. There will be no real market for the California sardines and pilchards without significant price cuts. (United States Consulate dispatch from Leopoldville, May 4, 1959.)



Brazil

JAPANESE-BRAZILIAN WHALING ENTERPRISE ACQUIRES TWO CATCHER BOATS:

A Japanese company in mid-May purchased from another Japanese firm two whale catchers, the No. 8 Toshi Maru and No. 11 Toshi Maru, each of 540 tons gross, with 1,800-horsepower reciprocating engines, at a price of 112 million yen (US\$311,000). The company completed preparations for whaling off the Brazilian coast by the joint Brazilian-Japanese company set up for that purpose in Brazil. About 45 men who are to work for this joint whaling enterprise were to sail for Brazil on the two catcher boats around July 10, 1959. (Nikkan Suisan Tsushin, June 1, 1959.)



Canada

MARINE OIL PRODUCTION, FOREIGN TRADE AND CONSUMPTION, 1958:

Production: Marine-animal oil production in Canada fluctuates sharply from year to year in accordance with the success or failure of the British Columbia herring fishery and to a lesser extent the seal fishery on the East Coast. In 1958, Canada produced 5.7 million Imperial gallons of marine oils as compared with 3.8 million gallons in 1957 and about 6.2 million gallons in 1956. The increase of about 48 percent in 1958 over 1957 was due to more landings of herring in 1958 in British Columbia.

Table 1 - Canada's Production of Marine-Animal					
Oils, 1956-1958					
	1958	1957 <u>1</u> /	1956		
	(I	nperial Galle	ons $2/$)		
Atlantic:		1	1		
Cod oil	630,540	823, 323	965, 198		
Herring oil	., 3/	107,900	148,271		
Other (seal, etc.)	4/938,562		405,436		
Total	1,569,102	1,644,066	1,518,905		
British Columbia:			i		
Herring oil		2, 180, 510			
Canada Total	5,696,102	3,824,576	6,244,808		
1/ Revised.					
12 / One Immedial callon - 1 2000 United States callons					

2/ One Imperial gallon = 1.2009 United States gallons.

3/ Not available as a separate item.

 $\frac{4}{4}$ Includes herring oil.

Exports: Canada was a net exporter of marine animal oils in 1956 and 1957 and estimates for 1958 indicate that im-

ports and exports are about in balance. In 1958, United States imports of herring and whale oils dropped sharply from the preceding two years, but in all three years the United States was Canada's best customer for cod-liver oil.

Table 2 - Canada's Exports of Marine Oils by Type and Country of Destination, 1956-1958				
	1958	1957	1956	
	(Imperial Gall		ons)	
Cod-liver oil, crude: United States	4,056	52, 120	67,243	
United States	427,287	519,465	587,777	
United Kingdom Others	96,974	29, 425 540	-	
Total	524,261	549,430	587,777	
Herring oil:				
Germany	162, 837 277, 733	_	1, 133, 558 99, 555	
Venezuela	-		2,222	
United States	298,666	20, 100	139,234	
Total	739,236	20, 100	1,374,569	
Whale oil:	735,230	20, 100	1,57 1,505	
Netherlands	-	_	91,067	
France · · · · · · ·		720	307	
United States · · · · ·	87,290	193, 312	257,776	
United Kingdom Sweden	262,888	19.070		
Total	350, 178		349, 150	
Fish oils, unclassified:				
Sweden	-	-	893	
Alaska	400	63		
United States	4,676	33,347	11,435 478	
Others	5,078	33,417		
Total marine-oil exports		868, 169	2, 392, 115	
Total marine-oil exports			1,063,465	
to United States • • •	363,603	010, 344	11,005,405	

Imports: In 1958 marine-animal oil imports were about 1.7 million gallons—up sharply from exports of 448,000 gallons in 1957 and 491,433 gallons in 1956. The United States share of Canada's marine-oil imports varied from about 65 percent in 1956 and 1957 to 85 percent for the first eleven months of 1958. The sharp increase in Canada's imports of fish oils in 1958 was probably due to a shortage of herring oil in Canada until the late fall of this year.

Consumption of Marine Oils: In Canada marine oils are used mainly for the manufacture of oleomargarine and shortening, with smaller quantities used in the manufacture of soap. In 1958, about 19.8 million pounds of marine oils were used in the manufacture of oleomargarine and 16.7 million pounds were used in shortening.

Canada (Contd.):

Table 3 - Canada's Imports of Marine Animal Oils by Type and Country of Destination, 1956-1957 and January-November 1957-1958					
	January-November 1958 1957		1957	1956	
		. (Imperial	Gallons)		
Cod-liver oil:		1			
United Kingdom	187,247	65,429	96,454	72,795	
France	-	-		22	
Norway	3,400	24,340	25,040	60,904	
United States	11	537	537	396	
Others	1,087	-	-		
Others	191,745	90,306	122,031	134,117	
Fish oil, unclassified:					
Japan	24,540	19,922	21,311	28,267	
United States	1,367,820	280,046	280,563	300,160	
	8,895	-	_	_	
Others	1,401,255	299,968	301,874	328,427	
Whale & Sperm oil:					
United Kingdom	7,169	8,203	8,203	11,219	
United States	9,859	14,841	15,176	17,670	
Norway	3,857	1,118	1,118	-	
Total whale & sperm oil	20,885	24,162	24,497	28,889	
Total all marine oils	1,613,885	414,436	414,436	491,433	
Total marine-oil imports					
from United States	1,377,690	295,424	295,424	318,226	

Table 4 - Canada's Consu	imption of M	arine Oils in	Margarine	and Shortenin	g, 1954-1958
	1958	1957	1956	1955	1954
			(1,000 Lbs.)		
Margarine: Production	145,607 19,806 13.6	130,645 17,070 13.0	124,707 16,835 13.5	125,094 23,497 18.8	115,868 15,783 13.6
Shortening: Production	163,288 16,741 10.2	152,047 26,377 17.3	157,244 21,298 13.6	153,745 21,003 13.6	156,714 15,974 10.2



Chile

LEGISLATION DRAFTED TO PROMOTE FISHING INDUSTRY:

The Chilean Government's Development Corporation, assisted by the National Fishing Society (Sociedad Nacional de Pesca) and the Fishing Association of Chile (Asociacion Pesquera de Chile), have drafted a bill to be presented to Congress during the May 21 to September 18, 1959, session. This bill is intended to promote industrial fishing activities in general. Tax rebates and exemptions for fishing firms are among its provisions and it is hoped this will facilitate credits from private sources for the renewal of fishing fleets and existing equipment.

The Chilean fishing industry experienced a considerable growth between 1953 and 1956 while it enjoyed the protection of Decree 208 under which it was granted special privileges within the then existing system of controlled imports and fixed rates of exchange. Between 1945 and 1953, Chile's yearly production of fish did not exceed 50,000 metric tons.

In 1956 a law was passed abolishing all privileges and the fishing industry suffered a setback which resulted in unemployment, lower production, and closing down of industries. The landings of fish, shellfish, and other marine products which amounted to 87,000 metric tons in 1953 reached a peak of 169,000 tons in 1955 and in 1958 totaled 161,000 tons.

From 1953 to 1958, the Chilean fishing industry grew without plan and while many new companies using imported new machinery and equipment for processing were started, little attention was paid to the lack of a well equipped and efficient fishing fleet. During those years, many foreign fishing vessels, and their crews, were hired but the actual number of Chilean boats remained inadequate, nor was there any plan followed to coordinate the industry's operations or promote the building of fishing vessels within the country.

In comparison, Peru, which started its fishing industry at a much later date, but was assisted by foreign capital

Chile (Contd.):

and know-how as a result of its favorable policies towards foreign investors, now has 5 well-equipped shipyards. These yards have been launching between 30 and 40 vessels a year. Peru has a fishing fleet of some 500 vessels of over 70 metric tons each, in good operating condition. On the other hand, despite its relatively better position with respect to raw materials, labor, power, and a wider variety of fish, Chile has a fishing fleet of only 70 vessels of over 70 metric tons each, of which no more than 50 are believed to be in seaworthy condition. Moreover, of these 50 there are 8 foreign vessels now working for Chilean firms. Chile has no shipyards capable of building modern fishing vessels.

It is significant that with a population not much larger than Chile's and a lesser number of potential consumers Peru in 1958 caught 980,000 metric tons of anchovies in addition to other varieties, while Chile's total fish catch during the same year was only 161,000 tons.

Equally significant is the fact that Peru, despite insufficient transport facilities and a lack of readily available power and labor, has managed to create a strong fishing industry. Chile, with better potentialties, is in a very inferior position. One cause of this anomaly is obviously the fact that while Peru has encouraged the admission of foreign capital and know-how, Chile has done nothing to attract them.

The present Chilean Administration is greatly concerned over this situation and is seeking ways and means of solving the industry's problems. It plans to promote greater consumption of fish in Chile through a broad educational campaign as a means of cutting down on the importation of Argentine beef and creating more jobs; it proposes to increase the protein factor in the diet of the average Chilean; it plans to stimulate the industry's growth by providing long-term credits at lower rates of interest, and reducing taxes.

Chilean exports of fish meal have varied from 3,332 metric tons in 1953, to a low of 1,387 tons in 1954, a high of 8,654 in 1955, and slightly over 4,000 tons for each year from 1956 through 1958.

At the present time there are approximately 42 companies engaged in the Chilean fishing industry. Not more than 20 of these can be considered of importance or are believed to own adequate processing equipment. The efforts of many small firms to improve their operations have been thwarted in the past years by lack of capital. Chile's new legislation is expected to assist both small and large firms to obtain credits for the purchase of equipment from private institutions on reasonable terms, and their future operations are expected to become more profitable through the reduction of their tax load. The new bill, when passed, will favor more particularly those firms which plan to engage in export operations and thus beome dollar earners. It will also encourage foreign capital willing to assist the Chilean fishing industry in its development and search for export markets, the United States Embassy in Santiago reported on June 3, 1959.

* * * * *

TWO UNITED STATES FIRMS INTERESTED IN DEVELOPING FISHERIES:

Two United States firms have expressed interest in developing Chile's fisheries. The plan of a Seattle company and an East Coast byproducts company is to bring four modern fully-equipped fishing vessels to Chile around September 1959. The vessels will catch and sell fish on a commercial basis to demonstrate the advantages of new equipment and modern

methods. The same firm will establish boat building and maintenance facilities. It has been estimated that 100 boats are needed now to meet existing shortages in Chile and 100 additional boats will be needed to replace obsolete Chilean equipment.

The United States east coast byproducts firm is interested in investing in fish reduction plants if results from the demonstration fishing fleet are favorable and if new regulations affecting the fishing industry are adopted by the Government.

Numerous studies have been made on Chile's fisheries. Most of the reports indicate good fishery resources. But the Chilean fishing industry to date has not been able to fully realize the potential of its fisheries. Fishing vessels are old, poorly equipped, and in bad condition. Fishing methods are outdated. Existing fish reduction plants are relatively modern, but are operating far below capacity due to lack of raw material.

New fishing regulations have been proposed and are under consideration by the Executive Branch of the Chilean Government in order to attract greater private investment in the fishing industry through tax exemptions and other measures.



Cuba

CLOSED SEASON ON SPINY LOBSTER ENDS:

The Cuban National Fisheries Institute terminated the closed season on spiny lobster effective June 20, 1959. The Resolution terminating the above closed season was published in the Official Gazette, No. 108 of June 16, 1959. The original closed season on lobster capture was imposed on March 15, 1959, the United States Embassy in Havana reported on June 24, 1959.

* * * * *

CLOSED SEASONS FOR SHRIMP, OYSTERS, AND TORTOISES:

The Cuban National Fisheries Institute initiated a closed season on the capture

Cuba (Contd.):

of tortoises and shrimp, effective June 15, 1959. The closed seasons for these species were to remain in effect until August 30, 1959.

The Institute also imposed a closed season on the capture of oysters off all coasts, with the exception of the provinces of Camaguey and Oriente. The closed season was effective as of June 10. 1959. Oysters from the provinces of Camaguey and Oriente when shipped to the market must be accompanied by a permit which will be issued by the Port Delegates of the Institute. This closed season will remain in effect until cancelled by a subsequent resolution.

The pertinent resolutions establishing the above closed seasons were published in the Official Gazette No. 101 of June 5, 1959.

Ecuador

CANNED SARDINE AND SALMON IMPORTS:
Imports of canned sardines and salmon into Ecuador during 1958 totaled 1.6 million pounds, valued at \$246,944, according to a United States Embassy dispatch from Quito dated May 29, 1959.

Ninety-four percent (1.5 million pounds) of the total quantity and 91 percent (\$223,659) of the total value was received from the United States, and believed to consist almost entirely of sardines.

Ecuadoran	Imports	of	Canned	Sardines	and	Salmon,	
		- 1	9581/				

19302		
Country	Quantity	Value
United States Portugal Panama Union of South Africa Canada ² / West Germany Other Countries	1,000 Lbs. 1,503 70 11 6 4 2	US\$ 1,000 224 18 1 1 1 1
Total	1,600	247

1/Mortly sardines, as very little canned salmon is consumed in Ecuador. 2/Canned salmon. Note: The dollar value is based on the official exchange rate of 15.15 sucres =

Current Consumption Trends: An excess of California sardines exists in Ecuador. Although there is a marked preference on the part of the Ecuadoran consumer for California sardines, it is possible to note in 1958 a relative growth in the consumption of other sardines, principally Portuguese.

Principal reasons that total imports of canned sardines in general and California sardines in particular are diminishing are the following:

- (a) Depressive Elements in the Economy; During 1958 these elements have caused a possible low intake per capita and, consequently, in the demand for both national and imported consumer goods.
- (b) Greater Competition: Three national sardine canners are now competing in the market. Although the quality of their product is not the best, the difference of about 20 percent in the sale price compared with similar imports (California sardines) is attractive to consumers. Canned tuna also has displaced usual consumers of imported sardines. Substitution of national products such as sardine and tuna for the imported canned sardines has resulted in the improvement of these products by local consumers.
- (c) Import Restrictions: Maintenance of tariffs, advance deposits in the Central Bank as required prior to the granting of an import license, and the acquisition of exchange in the free market at an average exchange rate higher than that of 1958 are discouraging several sardine importers from continuing in the business.
- (d) Strong Devaluation of the Colombian Peso: This has brought to a halt re-exportation of imported canned sardines that at other times took place in considerable quantities through commercial contraband with Colombia,
- (e) Decrease in Price of Similar European Products: During the first quarter of this year several Portuguese sardine can ning firms announced reductions of about 5 percent of the original f.o.b. price, possibly caused by the strong international competition in the marketing of these products.

Outlook: Although the general economic condition is slowly improving and better income levels are hoped for this year, the prospects for the import of California sardines are not good.

The surplus of stocks more than the strong competition of Portuguese and other European sardines and tuna has contributed to lowered prices of California sardines and a contraction of earnings on such sales. Consequently, the future for imports of these sardines is unfavorable.

The domestic sardine canning companies are making considerable efforts to improve the quality of their product with hopes of increasing sales and production. Consequently they are attracting an even greater number of the consumers of California sardines because of the similarity of this product, and it is probable that this will also affect the consumption of the European product to some extent. An Ecuadoran tuna canning company, a subsidiary of a large United States west coast cannery, soon hopes to use modern machinery for tuna canning, resulting in the reduction of prices and the widening of their market. The reported plans of the company to embark soon on the production of canned sardines as a subsidiary of the California company may result in obtaining a favorable export margin.

The expected expansion of this industry in Ecuador indicates that restrictions on imports probably will be maintained as a means of protection and eventually imports may be prohibited if the country becomes self-sufficient.

The stores of the Ecuadoran Social Services, Police, and Armed Forces enjoy liberation privileges for imports and are importing sardines, although not in large amounts. However, a project exists for the conversion of the stores to the exclusive sale of national products.

It is estimated that only a reduction in the export prices of California sardines which takes advantage of the highly flexible price that governs this product on the Ecuadoran market and nullifies the relative advantage of the similar national product or the granting of special credit conditions in favor of importers would be able to result in maintaining unchanged or improved levels of import of this product. (United States Embassy Quito, report of May 29.)



Ethiopia

DEVELOPMENT OF COMMERCIAL FISHING INDUSTRY PLANNED:

It was reported on June 9, 1959, in an Ethiopian daily newspaper by the Ministry of Press and Information, that a "fisheries training vessel" is being constructed at Massawa by the Ethiopian Government at a cost of Eth. \$45,000 (US\$18,000), and that it is being supplied with Eth. \$15,000 (US\$6,000) worth of equipment. The vessel and equipment are being financed by the United States Overseas Mission FY 1957 Defense Support Funds.

The newly established Ethiopian Section of Fisheries has employed a Danish fishing expert to undertake the training of five students, who have already been recruited to enroll in the course. The project, which is one of the first in the Naval Department's development program will, when established in the near future, qualify fishing officers who will serve as extension agents of the Fishing Section. They will be charged with the responsibility of advising local fishermen to whom they will also serve as government links.

The Fisheries Section plans to embark on a great and varied campaign to improve fishing in Ethiopia. The country has 5,000 miles of sea coast for fishing grounds extending for 12 miles out to sea in its territorial waters. While the coast stretching 150 miles from the border of the Sudan to Massawa is generally regular, the remaining area from Massawa to the French Somaliland border is mostly indented and is thus well suited for fishery development. Several of the inhabited islands off the east coast of Massawa and especially the Dahlak archipelago are rich fishing grounds. When the additional funds allocated by the Imperial Ethiopian Government Economic and Technical Assistance Board have been utilized, there is no reason why, with proper and planned development, Ethiopian fishing grounds cannot provide enough to meet the fishing needs of the country and a possible surplus for marketing abroad.

The development plans of the Fishery Section also include the establishment of fishery centers along the coast. Upon the completion of their training, each of the five fishery officers will be assigned to head a fishery center and will be delegated to assist the fishing population in his area. Local fishermen, who show sufficient interest in bettering themselves, can be permitted to use the training vessel temporarily. The government will also be prepared to assist financially fishermen interested in the purchase of fishing vessels.

Another phase of the development program is directed at regulating the primitive methods of fishing applied in the inland waters. The Fisheries Section has at present fishery administrative branches in Massawa and Assab. A survey project on the lakes and rivers in the interior will commence shortly to ascertain the extent of fishing potential and the fishing methods utilized. If this survey, however, is to prove worthwhile, the assistance of experts of United Nations Agencies in Ethiopia will have to be secured.

One of the several foreign governments who have shown interest in the promotion of fishing in Ethiopia is the Israeli government. The Fisheries Department of Israel has already requested to undertake a survey of Ethiopia's fishing grounds in the Red Sea to ascertain the fishing potential in that area. The outcome of this survey may result in a joint project which can prove profitable to Ethiopia. (United States Embassy in Addis Ababa, June 10, 1959.)

French Guiana

DEVELOPMENT OF SHRIMP FISHERY PLANNED:

Plans are under way for the development of a shrimp fishery off the coast of French Guiana, with Cayenne as base of operations, according to a report by the United States Consulate in Martinique.

The Credit Agricole Director pointed out the following:

(1) Scientific studies of fishing resources in French Guiana waters have disclosed the presence of a large quantity of shrimp French Guiana (Contd.):

along the edge of the continental shelf about 15 miles off the coasts of Surinam and French Guiana, extending down to the vicinity of Cayenne.

- (2) The shrimp are quite large, and when full-grown measure from 7.1-8.7 inches in length. Development of a shrimp-fishing industry, with the United States as the principal market, would contribute materially to the economy of French Guiana, and the French Government is prepared to extend substantial credits through the Credit Agricole to get such an industry started.
- (3) The first step is the development of a fishing base at Cayenne. This involves the building of a marine railway and repair base, with repair shops. There is already 220 cubic meters of cold-storage space at Cayenne, which could easily be increased; and icemaking capacity of 40 tons a day. Electrical generating capacity is more than sufficient for any expansion.
- (4) Next item is a small fleet of fishing boats. From 5 to 10 vessels 50 to 70 feet long are believed to be the kind of fleet needed. Vessels would not be equipped with mechanical refrigeration, but would carry ice. It has been proposed that Guadeloupe's fully-equipped fishing vessel, the Governor Felix Eboue be brought to Guiana to form the nucleus of a fishing fleet, but the Director said that present thinking is that the vessel is too big and elaborate for the job. It could, however, be used as a sort of mothership, to supply ice to and take on shrimp from the smaller vessels actually fishing.
- (5) It is believed that in the course of trawling for shrimp, the vessels would haul in many edible fish. These would be sold on the local market in Cayenne. Only the shrimp would be packed and shipped, probably by cargo plane to the United States.
- (6) It is primarily in the packing, shipping, and marketing phase of the operation that the French feel that they will need American technical assistance. The Director said that the French want to do a

top-notch job of preparation and packaging, to make the final product meet the highest American standards and bring the best possible prices.

According to reports, the French would like to keep the shrimp fishing industry in French hands, if they can. On the other hand, it is evident that they intend to start on a small scale.

It would appear from the location of the shrimp along the edge of the continental shelf that they lie well outside French territorial waters. However, it would be difficult for anyone to fish the shrimp without using Cayenne as a base of operations, as there is no other port in the area. It appears to be the French plan to start with development of a fishing fleet base in Cayenne, and to make further decisions as the situation develops. (United States Consulate in Martinique, June 23, 1959.)



Gree nland

FACILITIES FOR FISHING INDUSTRY TO BE EXPANDED:

A program of expansion of industrial projects in Greenland includes the establishment of fish canning and filleting plants, salting houses, and freezing and cold-storage facilities at Jakobshavn, Christianshaab, Godthaab, and Frederikshaab. The expenditures involved are estimated at 16.7 million kroner (US\$2,418,000) and will, it is expected, result in a material increase in the output of processed fish and shellfish in Greenland.

Full utilization of the expanded processing capacity will necessitate an increase in the number of fishing vessels and a changeover to larger seagoing vessels. However, the acquisition of new fishing vessels is outside the present program and, as in the past, will be undertaken by the Greenland fishermen, who are private owners of the fishing fleet, with the assistance of existing government subsidy facilities. It is estimated that between 5 and 6 million kroner (US\$724,000-\$869,000) will be required for the acquisition of new fishing vessels during the next several years.

Greenland (Contd.):

Facilities for the landing of fish in Greenland will be improved considerably through the construction of a new fisheries harbor at Godthaab and the expansion of existing harbors at Holsteinborg and Frederikshaab and mooring facilities at Jakobshavn, Christianshaab, and Sukkertoppen. The establishment of a fisheries harbor at Godthaab has been contemplated for several years and is considered necessary for the successful operation of the fishprocessing plants. The total expenditures on these projects is estimated at 7.6 million kroner (US\$1,100,000), including 6.2 million kroner (US\$898,000) for the new harbor at Godthaab (United States Embassy report of June 19 from Copenhagen).



Hong Kong

FISHERIES TRENDS, FIRST QUARTER OF 1959:

The Hong Kong fishing fleet landed about 22.1 million pounds of fresh marine fish during the first quarter of 1959. This catch was valued at HK\$14,338,986 (US\$2,509,000). About 2.0 million pounds of salt-dried fish, with a value of HK\$808,963 (US\$142,000), were landed. During the quarter about 208,600 pounds of shrimp were marketed through the Fish Marketing Organization. This limited supply of shrimp was principally for export to the United States. The marketing officer of the Fish Marketing Organization reports that the first quarter is the slack season for shrimp fishing in Hong Kong.

The Hong Kong fishing fleet continued to suffer from Communist-imposed restrictions on the use of the waters off the Pearl River delta. At the beginning of the quarter a Hong Kong fishing trawler was fired upon by a Chinese communist gunboat. However, there were no more incidents and at the end of the quarter authorities of the Hong Kong Government reported that although the Communists' restrictions were still in force, they were not being administered with great vigor. Hong Kong fishing vessels venturing into waters claimed by the Chinese Communists still run a risk. This risk

lies heaviest on wind-driven vessels which cannot shift fishing grounds rapidly.

About 200 fishermen who have been turned out of work by the Chinese Communist ban have accepted employment as construction workers on the new Shek Pik reservoir on Lan Tao Island. This employment was arranged by the Hong Kong Fishing and Commercial General Association, who obtained the cooperation of the construction company which is doing preparatory work on the reservoir. Of some interest to the Hong Kong fishing industry was the proposal put forward by two unofficial members of the Legislative Council that the Government take the lead in developing a fishing fleet. Although the Government has not officially accepted this proposal, it is possible that some action may be taken in this direction. (United States Consul in Hong Kong, June 10, 1959.)

Iceland

HERRING FISHERY TRENDS:

At the end of the main winter cod fishing season (ended May 10), most of the Icelandic motorboat fleet hauled-out for refitting in preparation for the herring season off the North Coast and in mid-May moved north to converge on the herring fishing grounds. In 1958, there were 242 Icelandic boats engaged in the North Coast herring fishery, and approximately the same number were expected to take part this year. Stormy weather kept the boats from starting as early as last year (June 17), but the first catches were expected about June 20.

The Icelandic Government agreed that the Export Fund should pay 70 percent export premium on North Coast herring processed as meal and oil, and 75 percent when salted.

The Herring Board has completed advanced sale contracts with Sweden and Finland, but negotiations are still underway with the U.S.S.R. and East Germany, the other two leading buyers.



India

EXPERIMENT WITH THAILAND CARP IN WEST BENGAL WATERS:

A species of carp (Cyprinus carpio) new to India, was introduced from Thailand last year and has been reared with encouraging results at the West Bengal Government's Departmental Fish Farm at Duttabad. The Thailand carp is a strain of a dwarf type of Chinese origin. This is reported to be the first attempt in India to cultivate this species with a view to ascertaining its compatibility with local varieties.

The important characteristic of this species which makes it suitable for conditions in West Bengal is that it is a prolific breeder and can breed in confined waters year-round. This solves a serious problem of procuring spawn for inland fisheries; most of the West Bengal carp normally breed only in flowing and flooded rivers and lakes. While it has been ascertained that the Thailand carp can thrive simultaneously with local carp without adversely affecting the growth of the latter, further research work is under way to determine whether this species is a competitor of the local carp.

The rate of growth of this species is believed to be much greater and produces 50 percent more fish than the local carp. The maximum weight of some of those reared has been 6 pounds while the average weight is about $3\frac{1}{2}$ pounds. The maximum length attained is 20 inches. The perfect temperature for breeding has been found to be 32° C. (89.6° F.). Another important aspect of this species is that it grows naturally in confined waters, requiring practically no attention at all during growth.

The introduced Thailand carp with its various advantages over West Bengal carp holds out hope for increasing production of fish in inland water areas. Initially the Fisheries Department contemplates planting a small number of fish in selected ponds and tanks throughout the State where it can breed naturally.



Indo nesia

CANNED SARDINE MARKET:

As of June 1959 canned Japanese sardines were about the only imported sardines on the Indonesian market. Early in 1959 there were some offerings of sardines from the Netherlands and the United States. The Japanese canned sardines are preferred in the Indonesian market because the price is lower and the quality about the same as for sardines from other foreign sources. No sardines are canned in Indonesia and imported sardines are popular, but imports are limited because of the short supply of foreign exchange.

During 1958 sardine imports amounted to about 2.5 million pounds. Imports from Japan accounted for 2.4 million pounds and the United States share was only 16,700 pounds. Netherlands and other countries also supplied small amounts.

Japanese canned sardines in June 1959 sold for about Rp. 30 (29 U.S. cents) a 15-oz. oval tin packed in tomato sauce. Six months earlier when the United States and the Netherlands provided a little competition, the market price of United States sardines in a 15-oz. oval can packed in tomato sauce sold for Rp. 20 (19 cents). The Japanese 15-oz. oval can in tomato sauce at that time sold for Rp. 15 (14 cents). (United States Embassy report of June 4 from Djakarta.)

Note: Values converted at rate of 104.2 rupiahs = US\$1.



Japan

CANNED LIGHTMEAT TUNA PRICE CUT CONSIDERED:

On June 18 at a conference of directors of the Japanese exporters' association and the Tuna Sales Committee, trading company representatives expressed their views on suitable selling policies for canned tuna in brine, both lightmeat and whitemeat.

Of this year's global quota of 2,490,000 cases of canned tuna in brine, the joint sales company has so far sold 1,230,000 cases. Third countries have exported about 160,000 cases to the United States.

The remaining 1,100,000 cases must be sold by October, but of this all that can be expected in the way of whitemeat supply is about 100,000 cases (the present whitemeat inventory of the sales company is about 40,000 cases), so the greater part of the quota must be filled with lightmeat.

Strenuous measures will be required to sell this lightmeat tuna, according to the Japanese. With regard to measures for selling the 1 million cases, it was reported that a certain trading company had offered to take on the whole amount at the present price. Some of the producers were urging the joint sales company to exercise its right to use only 50 percent, which is the sales company's free sales quota. There was strong opposition to those ideas, and the majority favored getting past the crisis by such measures as cutting the price of canned lightmeat and putting more effort into advertising. No conclusion was reached at the conference, and further meetings were scheduled. (Nikkan Suisan Tsushin, June 18, 1959.)

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CUT IN PRICE FOR LIGHTMEAT CANNED TUNA OPPOSED:

With reference to the Japanese tuna trading companies proposed reduction of US\$1 in the price of lightmeat canned tuna in brine for export to the United States, it has been pointed out that such a cut would mean a loss of US\$800,000, even if lightmeat sales were held to the minimum level of 800,000 cases. If price reductions under floor clauses are included, the loss would amount to more than US\$1 million. Therefore, it was considered highly probable that the packers, who are under the necessity of producing whitemeat at a considerable loss, will absolutely refuse such a price cut and will rather seek a raise of about US\$3 in the price of whitemeat (Nikkan Suisan Tsushin, June 23, 1959.)

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CANNERS SCALE DOWN PROPOSED PACK OF CANNED WHITEMEAT TUNA:

The Japanese Export Canned Tuna Producers Association held a directors' meeting on June 11 to discuss revision of its earlier plan on the pack ratio for light-meat and whitemeat canned tuna. It was decided to reduce the whitemeat pack ratio from 55-65 percent to a minimum of 35 percent.



Cutting table in a tuna cannery in Hiroshima, Japan.

At a directors' meeting in March of this year it had been decided to produce canned tuna in brine for export this year in the ratio of 55-65 percent whitemeat to 35-45 percent lightmeat; however, since that time the landings of albacore (summer albacore), which are the raw material for whitemeat tuna, have been very light, and the ex-vessel price has increased steeply until in mid-June it was around 150-165 yen per kilogram (US\$378 to \$415 a short ton). This has limited the pack of whitemeat canned tuna. No maximum was set in order to allow for elasticity to cope with changes in the fishing conditions.

It is anticipated that packing will now be concentrated on lightmeat, but according to trading company sources, the market for lightmeat tuna in the United States, which is the largest market, is soft. (Nippon Suisan Shimbun, June 15.)

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CONSIGNMENTS OF CANNED TUNA FOR APRIL-JUNE 1959:

Scheduled consignments to the Tokyo Canned Tuna Joint Sales Company for the first quarter of the Japanese fiscal year (April-June) were about 960,000 cases, but up to June 18 they had received only about 820,000 cases (459,000 cases of

lightmeat and 362,000 cases of whitemeat, both types canned in brine), leaving about 140,000 cases of the quota to fill.

It was estimated that there remain unsold out of those consignments 350,000 cases of lightmeat and 40,000 cases of whitemeat (7-ounce cans only)--13ounce cans and 2-kilogram cans (4.4 pounds) are 45,000 cases short. If whitemeat was to make up more than 35 percent of the total production quota, as decided at the recent meeting of the directors of the canners' association, an additional 540,000 cases should have been consigned by July 3. However, the pack that could be expected from summer albacore, if the small landings of about 100 tons a day continue, would be only around 100,000 cases or, at most, including goods under inspection, etc., about 200,000 cases. (Nikkan Suisan Tsushin, June 23, 1959.)

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TUNA EXPORT REGULATORY COUNCIL PLANNED:

A visit by officers of the Japanese Export Tuna Canners' Association to the Chief of the Japanese Fishery Agency's Production Section on June 18, 1959, gave birth to the idea of setting up a regulatory council to be concerned mainly with tuna export problems. Since then the formulation of plans has proceeded speedily. The Fisheries Agency sections concerned have drawn up plans for the membership, organization, and operation of the council.

The council will have the status of a consultative organ for the Fisheries Agency, and will serve for liaison among groups which have hitherto lacked lateral connections. At the same time it will take up individually concrete problems related to exports, such as the foreign base problem and the transshipment problem, discuss them, and make decisions. Members are expected to be H. Ueda of the Export Tuna Canners' Association, K. Nakabe representing the freezers, and S. Masuda of the Tuna Fishermen's Federation. The idea is for responsible representatives of the industry, by consultation, to adjust problems which and sales problems.

are potential sources of trouble. The Fisheries Agency is thinking of making its granting or withholding of licenses and permits dependent on whether or not the council can reach agreement. (Nikkan Suisan Tsushin, June 22, 1959.)

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JOINT SALES COMPANY FOR FROZEN YELLOWFIN TUNA EXPORTS:

Discussions in Japan on the establishment of a frozen yellowfin export joint sales organization had been interrupted since May, but sentiment in favor of it has increased again because of the higher percentage of rejects reported on shipments to California tuna canners. On July 8 a committee composed of both land freezers and shipboard freezers, appointed by the Export Tuna Freezers' Association to study this question, met and agreed on the speedy setting up of a joint sales organization for exports of yellowfin tuna by liner from Japanese ports to the United States.

The concensus is that the establishment of a strong joint sales organization is essential in order to plan improvement of sales and reduce the amount of rejects at the canneries. The shipboard freezers (clipper operators) are taking the position that a condition of the establishment of a joint sales organization must be that the minimum ex-vessel price must be maintained at about \$200 a short ton, and the land freezers have also agreed on setting up a system to guarantee a minimum ex-vessel price.

The committee on setting up the joint sales organization held its first meeting on July 9, and informed sources say that the new sales organization's functions will not necessarily be limited to socalled "liner" exports from Japanese ports.

The following reasons are cited for the change in the clipper operators' stand about a joint sales company:

(1) The recent increase in rejects of transshipped tuna at California canneries has made the shipboard freezers feel keenly the necessity for setting up a strong sales organization to deal with claims and sales problems.

- (2) As the novelty of the transshipment export trade wears off, there is certain to be an increase in the quantity of ship-frozen tuna landed in Japanese ports. This will bring a strong possibility of a drop in ex-vessel prices in Japan, and in order to forestall this, the clipper operators are moving in the direction of improving liner export prices and establishing minimum guaranteed ex-vessel prices.
- (3) It has become impossible to expect that ex-vessel prices will stay at a high level even though export prices fall, as was the case until last year. Now ex-vessel prices and export prices have come to move up and down together, and this has brought the vessel operators around to feeling greater concern over the movements of the export market. (Nikkan Suisan Tsushin, July 10 and 13, 1959.)

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METHOD FOR DETECTING GREEN MEAT IN RAW TUNA FOUND:

Lately, increasing buyers' claims a-gainst frozen tuna shipped from the Atlantic have been causing concern in Japan. A method has now been found for detecting, before cooking, the green meat condition which is the main cause of claims, and it is hoped that this will help solve the claim problem and reduce the percentage of green tuna rejects. (Previously, green-meat tuna could be detected only after cooking.)

The method has resulted from joint studies by the Frozen Aquatic Products Inspection Association and the Tokai Regional Fisheries Research Laboratory. They found that color of the kidney tissue of fish which showed green meat after cooking was conspicuously darker than that from normal fish, and they discovered an easy method of detection by using an aqueous suspension. The method is to take about 10 grams of kidney as close to the center of the organ as possible and mash it. Then 1 gram of the tissue is placed in a small flask, about 50 cc. of water is added, and the flask is shaken. The occurrence of green meat can be predicted by the color of this fluid. The gradations of color are:

- (1) red, reddish brown, slightly reddish brown
- (2) light brown, brown, dark brown, dry leaf color
- (3) brownish black, grayish black, black

Of these three colors, the green meat phenomenon turns up mostly in group (3), which looks like soot dissolved in water. The degree of accuracy attained was 80 percent at the Tokai Laboratory and 100 percent at the Inspection Association.

It is explained that the trade in yellowfin from the Atlantic through Haiti and Panama looked very hopeful at first because rejects were few, but since the first of this year the incidence of rejects has gradually increased until recently it has risen as high as 30 percent. People concerned have considered that this is probably an effect of the falling market for canned tuna, but at the same time serious thought has been given to finding a method of preventing or detecting in advance the green meat or dark meat conditions which are the main cause of claims against frozen tuna whether transshipped or exported from Japan. Source: Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 8, p. 679, Hirao et al. (Suisan Keizai Shimbun, June 16, 1959.)

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FISHERMEN SEEK ALBACORE ON DISTANT GROUNDS:

The Japanese summer albacore fishery this year has been completely abnormal, and the ex-vessel price at Shimizu has risen to an unprecedented 180 yen per kilogram (US\$450 a short ton). Stimulated by these high prices and by reports that albacore schools have appeared far off to the east, part of the Shimizu fleet has begun a rapid movement into the eastern grounds. This movement was begun by boats from Kagoshima Prefecture, and now some Shizuoka Prefecture boats have moved out as far as 156° E. and 160° E. longitude, and exploitation of grounds 1,000 miles or more from the coast has begun.

Some of the Mie Prefecture boats, which are finding that skipjack fishing has slacked off, are also planning to make

their next trips for albacore 1,000 to 1,500 miles east of Japan.

Up to now the nearer grounds have afforded poor fishing, and the industry is watching with intense interest to see whether good fishing will develop off to the eastward. (Nippon Suisan Shimbun, June 27, 1959.)

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SUMMER ALBACORE LANDINGS BELOW NORMAL:

Summer albacore landings in Japan as of July 11 amounted to only 7,200 metric tons. This is only one-third of the small 1958 catch, and about one-fifth of a normal year's catch. As a result, the Japanese freezers have been able to buy hardly any summer albacore, and the frozen tuna inspection office in Shimizu, for the first time since its establishment, has inspected no summer albacore for export.

The canners' pack of whitemeat tuna for export to the United States has finally reached 500,000 cases (including what the packers had on hand at the end of the last fiscal year). Counting on the expected pack from winter albacore, all packers except the three largest ones will just barely be able to fill their minimum white meat pack quotas of 35 percent of their total tuna pack allotments, so that on the canned pack side at least the worst possible shortage has been avoided. (Nikkan Suisan Tsushin, July 13, 1959.)

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WORLD-WIDE TUNA FISHING CRUISE PLANNED:

Japanese tuna fishing circles in Shimizu are watching with interest the progress of a plan for a year-long, round-theworld tuna fishing trip. The vessel is No. 5 Seiju Maru (500 tons gross), which was due to sail in July with a captain and 30 crew members to fish in the Indian Ocean, the Mediterranean, the Atlantic Ocean, and the eastern Pacific Ocean, and sell the catch at various ports.

Principal fishing grounds will be in the Indian Ocean, off the Gold Coast of Africa, and off Brazil in the Atlantic, and, after traversing the Panama Canal, in the Pacific Ocean around the Galapagos Islands. The catches of yellowfin and albacore will be landed in Germany, Yugoslavia, and Cristobal in Panama.

The Seiju Maru is the latest type of large tuna long-liner, and was planned for operations in distant waters. She carries 1.5 times as much fish as older boats of the same tonnage, and has the capacity to freeze 30 tons of tuna perday. The grounds that will be fished by the Seiju Maru were surveyed last year by the research vessel Shoyo Maru, of the Japanese Fisheries Agency. The industry is showing deep interest in this bold plan of a privately-owned vessel. The Seiju Maru is scheduled to return to Japan in July of 1960 (Nippon Suisan Shimbun, June 24, 1959).

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MACKEREL-PIKE CANNERS PLANNING TO LIMIT PACK NEXT SEASON:

The Japanese Mackerel-Pike Export Canners Association met on June 5 and considered plans for the 1959 canning year (August 1959-July 1960). The plans were to be submitted to the membership at a meeting on June 18. The major points of the draft were: (1) Total production quota of mackerel-pike or saury to be 660,000 cases (past season's was 1,030,000 cases), of which 60,000 cases will be allocated equally among the canning companies, 500 cases to a producer. Last season there was no such equal allocation. The remaining 600,000 cases will be allocated as follows: 590,000 cases in the proportion of 8 based on past pack records to 2 in a free quota. A quota of 10,000 cases will be for new producers. (2) Use of the free quota will be limited to 5,000 cases per company, except that companies which joined in 1958 will be limited to 1,000 cases and those that joined in 1957 to 2,000 cases.

The large-scale cut in the over-all pack quota is considered unavoidable in view of the present sales situation and the inventories held by the joint sales company. Furthermore, the reserve quota and adjustment quota systems which were in effect the past season have been dropped because of the order for the

control of "outsiders" which was expected to be promulgated on August 1 of this year. (Nikkan Suisan Tsushin, June 6, 1959.)

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MACKEREL-PIKE CANNING PLANS FINALIZED:

The Japanese Mackerel-Pike Export Canners Association held a special general meeting on June 18 to consider mackerel-pike or saury packing plans for the 1959 production year (April 1, 1959-March 31, 1960). Export shipments for 1959 will be 660,000 cases (472,000 cases allotted by past production records, 118,000 cases free quota, and 70,000 cases to be equally allotted among packers). Sales prices and production quotas by can sizes and styles will be decided later. As of June 15, stocks held by the joint sales company were 462,478 cases. (Nikkan Suisan Tsushin, June 18.)

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EXPORT PROSPECTS FOR CANNED CRAB MEAT THIS YEAR:

It is expected that the pack of canned king crab meat this year by Japanese factoryships and land canners combined will be around 420,000 cases. Trading circles believe the prospects are for export of about 380,000 cases. Traders expect that of the 420,000-case pack, about 70,000 cases will be sold on the domestic market, leaving 350,000 cases for export. Of this it is estimated that 100,000 cases will go to the United Kingdom, 200,000 cases to the United States, and 50,000 to other countries. Of those principal markets, the 100,000 cases for the British is considered sure. The British consume annually about 200,000 cases, of which at present the U.S.S.R. and Japan each supply approximately half. If there is no sudden change for the worse in Britain's foreign exchange situation, and if the U.S.S.R. does not embark on any drastic price cutting, there will probably not be any change in this balance in the market.

With regard to the 200,000 cases for the United States no important change is expected. Among the markets for the remaining 50,000 cases, hitherto Europe, Australia, and Hawaii have been most important, but it is thought that Hawaii's becoming a State may have an adverse effect on the export market there. (Nippon Suisan Shimbun, June 5, 1959.)

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PLANS TO ADVERTISE CANNED FISH IN FOREIGN COUNTRIES:

The Japanese have revealed a number of plans to advertise canned fish in foreign countries in order to increase consumption in markets abroad. The advertising plans were announced by the Japan Export Trade Research Organization after it consulted with the packers and canners.

To advertise canned mackerel-pike, a motion picture costing \$11,000 (about \$5,500 is to be provided by the Japanese Government) is planned. In addition, it is planned to spend about \$4,100 in Canada to advertise on television.

For canned sardines, a \$972,000 advertising program in Philippine newspapers was announced.

Ads in the British periodical Economist for canned crab, salmon, trout, and tuna are planned, costing about \$500.

Funds for the promotion programs announced will be supplied by the packers' associations and the Government. In addition, the use of signs and posters is also under discussion.

Advertising of canned tuna in the United States market was also announced. About \$140,000 will be used for ads in newspapers and magazines. In 1958 a joint Japanese-United States advertising program had been planned, but agreement was never reached. Therefore, the money not used was carried over for this year's advertising program, with the addition of funds provided by the tuna canning and freezing industries in Japan, and the Japanese Government.

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PLANS INDEFINITE FOR ADVERTISING TUNA IN THE UNITED STATES:

Advertising Japanese tuna in the United States has been planned with a fund of 50 million yen (approximately US\$140,000), including money carried over from last year. However, exporters of canned and frozen tuna have been unable to agree on the manner in which the advertising is to be handled. Plans for the campaign are at present being examined by representatives of the canning and freezing industries, together with the Japanese Fisheries Agency and the International Tuna Council, but because the industry is faced with serious problems as a result of the poor summer albacore season, the planning temporarily is at a standstill.

As a result, the initial policy, which was to advertise during the summer and the Lenten season, broke down, and because there is a lag of about two months between the ordering of advertising and its appearance, it looks very much as if the advertising will appear after September, at the earliest. The plans have been somewhat modified from those submitted earlier by the International Tuna Council and those concerned were hoping for a final decision before the end of June. Canners have been maintaining that the campaign should emphasize tuna in brine, while freezers have been in favor of advertising which would also indirectly benefit tuna canned in oil. (Suisan Keizai Shimbun, June 11, 1959.)

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STUDIES ON MARKETING OF CERTAIN FISHERY PRODUCTS IN UNITED STATES PLANNED:

The Japan Export Trade Promotion Organization has budgeted US\$6,000 for the coming year for studies of the possibility of marketing canned saury or mackerel-pike in the United States, for investigation of the organizational connections of the movements to restrict Japanese canned oyster imports, and for a canned crab market survey. Personnel stationed in the United States will shortly receive instructions to carry out these studies as follows:

Canned mackerel-pike survey, \$1,000 budgeted. At present in the southern part of the United States some low-income groups are consuming canned jack mackerel, mackerel, and sardines. In order to predict the possibility of substituting Japanese canned mackerel-pike, which is as yet unknown in that area, samples will be shipped to representative cities of the State of Mississippi to canned goods wholesalers and retailers, housewives, and newspaper and magazine reporters, and the following points will be investigated: (1) sales possibilities; (2) suitability of tomato sauce, oil, or water pack; (3) suitable sizes of cans for each pack; (4) suitability of the prices; (5) taste acceptance.

Canned oyster survey, \$3,000 budgeted. The background of the recent movement to restrict Japanese imports -- that is, falling production and rising prices in the East Coast area--will be analyzed. and the following will be studied: (1) annual production by types of goods in the United States; (2) imports by country of origin and type; (3) comparison of prices of Japanese and American goods; (4) prices and commissions in the distribution process; (5) present tariff conditions; (6) consumption of boiled oysters; (7) demand for seed oysters on the Atlantic and Gulf coasts; (8) supply and demand prospects for raw and canned oysters by areas; (9) distribution by states of oyster growers, importers, and canners.

Frozen and canned tuna, \$5,000 budgeted. For survey of quantities of frozen and canned tuna exported, distribution routes, quality, advertising methods, and consumer capacity. Also canned tuna production in countries exporting to the United States, particularly methods of obtaining raw material, production capacity, and statistics (Suisan Keizai Shimbun, June 20, 1959).

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NEW TUNA LONG-LINER COMPLETED:

The largest privately-owned high-seas tuna fishing vessel in Fukushima Prefecture was completed early in June. It is the tuna long-liner No. 18 Seisho Maru (239 tons gross). This vessel, which carries a crew of 28, was built by the Yamanishi Shipyard of Ishinomaki at a cost of about 100 million yen (US\$280,000).

Fukushima Prefecture already had a large prefectural fisheries guidance vessel, the Iwaki Maru (475 tons) and the training ship Fukushima Maru (221 tons); the completion of the No.18 Seisho Maru brings the number of vessels of over 200 tons gross in the prefecture to four, including one other privately-owned vessel.

The feature of the new vessel is its modern equipment, including radar, loran, directional fish-finder, and electric water temperature thermometer, making it perhaps the best equipped vessel of its type in Japan. The engine is a 550 hp. Diesel with supercharger, and there are two 80 hp. auxiliaries. Fish-carrying capacity is 135 tons, and although it has been considered impossible to equip a vessel of under 350 tons gross with freezing capacity of more than 3.75 tons a day, the builders have managed to put a capacity of $4\frac{1}{2}$ tons into this vessel. Speed is 12 knots, and cruising range is 24,000 miles. The hull is steel, and mostly electrowelded. The vessel is equipped with automatic pilot and remote-steering control. There is a speaker in each compartment of the vessel, and these are wired so that even if the speaker switch is turned off, emergency signals can be broadcast.

The No. 18 Seisho Maru sailed from Ena on June 10, and after calling at Misaki in Kanagawa Prefecture was to proceed on her maiden voyage to fish tuna in the Marshall Islands area.

Last fall the question of the most economical size for tuna boats operating in distant waters was the subject of debate between the vessel operators and the Fisheries Agency. Now such a vessel, a specialized tuna long-liner of the 250-ton class, has been completed. The vessel is the first such tuna long-liner built for a private owner in Fukushima Prefecture.

Since before World War II the Japanese high-seas tuna fishery has flourished, and it has been said that all of the tuna grounds of the Pacific have already been fully developed. It is considered that grounds producing catches of over 2,000 kan (slightly more than 8 short

tons) a day can be found only by going to the Indian Ocean or the Atlantic. On this point, the people responsible for the building of the No. 18 Seisho Maru boast that she is a classic type of a completely economical vessel, which can pay fully on catches of 1,000 kan a day (4 tons) but which can also go to the Atlantic, if necessary.

The No. 18 Seisho Maru is planned primarily for fishing in the equatorial Pacific, around the Marshall and Caroline Islands, and in the Indian Ocean. Her officers consider that she can be operated satisfactorily on catches of around 4 tons a day, taking 35 days of fishing to get a full load and making trips of about 75 days. This figure of 75 days includes 40 days running to and from the grounds. This allows for the vessel's being sent immediately to the Indian Ocean, in case catches on the Pacific grounds fall below 1,000 kan (4 tons) a day. Much attention has been given to electronic instrumentation in order to economize on running expenses in case of shifts from one fishing ground to another.

According to those responsible for the building of the vessel, the initial plan was to build a boat of the 350-ton class, but after calculating the operating expenses and estimated catch of such a vessel, it appeared that a minimum daily catch of 1.500 kan (about 6 short tons) would be necessary. This wasn't possible because in the principal tuna grounds of the equatorial Pacific, catches of over 1,000 kan a day are exceptional. In order to make catches of 1,500 kan regularly, it is necessary to go to the Indian Ocean or the Atlantic. Therefore, it was decided to build a vessel of the 250-ton class, which could operate quite profitably on catches of 1,000 kan a day. As a means of raising efficiency and saving fuel while running at night or in fog or squally weather, radar and loran were installed. The loran receiver will enable the captain to record accurately the position of good fishing grounds, so that they can be found again without fuel-consuming searching. The vessel's communications equipment includes a 250-watt, 22 MC main transmitter which will enable her to communicate satisfactorily with her base in Japan

from as far away as the South American coast. (Suisan Keizai Shimbun, June 12 and 14.)

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COMPANY EXPANDS TUNA FISHING FLEET:

A Japanese fishing company has already built two tuna fishing vessels (No.1 Kaki Maru and No. 2 Kaki Maru), each of 380 tons gross. Now the company's No. 3 Kaki Maru, 450 tons gross, has recently been completed by the Miho Shipyard at Shimizu, and was to be launched on June 2.

This Japanese company plans to put more and more of its efforts into tuna fishing in distant waters, and plans to build two more tuna boats. The No. 3 Kaki Maru cost 160 million yen (about US\$448,000) to build. The new vessel was expected to sail for the Atlantic early in July, and it is planned that she will make about five trips a year. (Nikkan Suisan Tsushin, June 1, 1959.)

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LOANS FOR CONSTRUCTION OF FISHING VESSELS IN 1958:

Loans from the Japanese Government's Agriculture, Forestry, and Fisheries Fund for vessel construction in 1958 were as follows: for large tuna boats, 18 loans totaling 641 million yen (US\$1,781,000); for medium tuna boats, 68 loans totaling 774 million yen (US\$2,150,000); for East China sea trawlers, 19 loans totaling 550 million yen (US\$1,528,000); for medium sized home-waters trawlers, 30 loans totaling 300 million yen (US\$833,000); for seiners, 13 loans totaling 160 million yen (US\$444,000); for salmon driftnetters. 41 loans totaling 410 million yen (US\$1,139,000). Loans for medium-sized tuna boats (40-100 tons gross) were up 390 million yen (US\$1,083,000), more than double the 1957 figure (Suisan Keizai Shimbun, June 21, 1959.)

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SECOND TUNA VESSEL FOR THE SOVIET UNION COMPLETED:

A Japanese shipyard recently completed the second of two tuna vessels for the Soviet Union. Delivery was scheduled to take place on June 14. The 500-gross-ton vessel will be towed to Vladivostok by a Soviet freighter.

The same shipbuilding company that built the two tuna vessels also worked on two herring factoryships of 4,900 deadweight tons for the U.S.S.R. Refrigeration machinery for the tuna and herring vessels has been ordered from a Japanese company of Osaka at a cost of about 300 million yen (US\$833,000). This is the first such large order from the U.S.S.R. Delivery was scheduled for the end of August.

The equipment for each tuna vessel will be two ammonia machines of 40 horsepower (one for freezing and one for precooling) with a daily refrigeration capacity of 120 tons. The herring vessels will have four air-cooling machines, and five (for each vessel) 50-horsepower freon freezing machines, plus two 7.5 horsepower freezing machines for keeping stores. With this equipment, the temperature throughout each herring factoryship can be suitably regulated. (Nikkan Suisan Tsushin, June 4 and 10, 1959.)

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TUNA FISHERMEN'S FEDERATION OPPOSES REDEPLOYMENT OF SALMON FISHERMEN:

Because the Japanese North Pacific salmon fishery is being restricted more and more each year, the Japanese Federation of Salmon Fishermen has been pushing a plan to redeploy part of the salmon fishermen into tuna fishing. The Japan Tuna Fishermen's Federation met on June 11, 1959, with newsmen to explain that they had decided on absolute opposition to any redeployment of surplus salmon fishermen into the tuna fishery because of present trends in the tuna resources and because of the present economic conditions in the fishery. The main points were as follows:

The salmon fishermen's federation has asked the tuna fishermen's cooperation in arranging for excess salmon fishermen to enter the tuna fishery with 20 or 30 tuna boats of the 250-ton class, as part of a comprehensive plan for reorganizing the salmon fishery. In view of

the trends of the tuna resources and the present economic conditions in this fishery the tuna fishermen believe it is unreasonable to redeploy more fishermen into it from other fisheries.

The salmon fishermen's group has suggested, as a method of handling this proposed redeployment, that there are now 46 research ships and school ships belonging to local governments and that as the operations of these vessels are having bad effects on the economy of the tuna fishery, they should be done away with, thus making room for the entry of the salmon fishermen into the tuna fishery with 20 or 30 vessels. The Tuna Fishermen's Federation cannot understand the thinking behind this proposed exchange.

The reason behind the idea of supplanting research and training vessels with commercial tuna boats operated by former salmon fishermen, as proposed by the Salmon Fishermen's Federation, is the contention that these research boats and school ships are tending to neglect their proper function of surveying the resources and are operating commercially, thus having a bad effect on the economy of the tuna fishing industry. The tuna fishermen's group also took up this problem at its 1956 general meeting, and passed a resolution asking that more circumspection be exercised in the operations of the research and training ships. The tuna fishermen now say, however, that although they are not satisfied with the present state of those vessels' operations, the situation is improving under the guidance of the Fisheries Agency. It is not impossible that in the future the tuna fisheries will come under some sort of international restrictions, like those involved in Japan-China and Japan-U.S.S.R. fishery agreements, and in such a case the research vessels will be needed for research on the tuna resources. For these two reasons, the tuna federation is unable to accept the salmon fishermen's reasoning. (Nippon Suisan Shimbun, June 15, 1959.)

DISPOSAL OF FOUR SALMON FLEETS CONSIDERED:

In connection with reorganization of the North Pacific mothership salmon fishery, the Japan Federation of Salmon Fishermen has been asking for compensation (3 million yen, about US\$8,300) for anticipated operating losses this year. At the same time, considering that it will be necessary to reduce the salmon fleet by 120-130 boats, the Federation wants 60 of these boats shifted into the gill-net salmon fishery south of the Japanese-Russian treaty area and the rest either absorbed into the tuna fishery or compensated for leaving the salmon fishery on the same terms as applied in last year's reduction of the salmon fleet. The Japan Federation of Tuna Fishermen is diametrically opposed to the salmon fishermen's proposal. The Japanese Fisheries Agency has set up a preliminary plan for the reduction of the salmon fleet and is considering it in consultation with officers of the Salmon Fishermen's Federation.

The preliminary plan was completed on June 2, 1959, but is still in draft form. It is based on a policy of cutting out four fleets and 120 catcher boats, by one of two methods. The reduction could be made on the basis of the Law for the Protection of Fishery Resources (18 million yen or about US\$50,000 compensation, two-thirds subsidy, and payment of interest), or by the formation by the vessel owners, after return from the fishing grounds, of an Adjustment Association for handling both temporary and permanent retirement from the fishery (2-3 million yen or US\$5,500-\$8,300 for temporary retirement, 18 million yen or US\$50,000 for permanent retirement, two-thirds subsidy, and payment of interest). However, the Fisheries Agency plan is not being met with great favor as it does not completely satisfy the basic principle of the reorganization, which is that from next year forward both the motherships and the catcher boats are to be put into a position where they can operate without financial loss. (Nikkan Suisan Tsushin, June 19, 1959.)

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NORTH PACIFIC SALMON FISHING FIRMS APPLY FOR PERMITS TO FISH FOR TUNA IN FIJI ISLANDS AREA:

A Japanese fishing company is planning to send out a tuna mothership fleet this year. Because of the declining trend of the North Pacific salmon fishery, on which it has largely depended, and the increasing demand for tuna for fish ham and sausage. Application for a license was to be made to the Japanese Fisheries Agency as soon as preparations were completed.

The fleet, comprising one mothership and about 40 salmon catcher boats, was to sail early in September and operate in the Fiji Islands area until the end of the year. For a mothership the firm will either convert one of its salmon factoryships or charter the Kyokuzan Maru from a Japanese whaling company. The use of salmon boats in the fleet is not settled as special permits will have to be sought. It is reported that the authorities' policy will be to license this proposed operation because the company has a prior record of participation in the tuna mothership fishery.

According to plans, the company will utilize the production record of another company, which caught about 2,000 short tons of fish in 1954. The production goal for the new fleet will be over 4,000 metric tons, and except for the products for export, most of the catch will be used at the company's plant for fish sausage and ham.

Another Japanese company has recently revealed its plans to engage in mothership-type tuna fishing this year. According to the announcement, the mothership will be the 7,200-ton Jinyo Maru, which is at present engaged in the North Pacific salmon fishery. The fleet will comprise 10 regular tuna boats, 40 salmon boats with part-time tuna licenses, and 2 carriers. Fishing will be done around the Fiji Islands from early September to mid-December. The catch goal will be 6,270 tons of tuna and other fish. (Suisan Keizai Shimbun, June 20, 1959.)

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PRICE OF TUNA FISHING RIGHTS RISING STEEPLY:

Because of the curtailment in the Japanese North Pacific salmon fishery, movements for shifting into the tuna fishery or for obtaining part-time tuna fishing licenses for salmon boats have become very active. In addition, the big fishing companies are buying up tuna fishing rights. As a result the price of those rights has recently risen sharply. In the case of full-time tuna fishing licenses, the price hitherto has been 70,000 to 80,000 yen per ton (\$196 to \$224 per ton) based on the gross tonnage of the vessel, but this has now risen to 120,000 yen (\$336). Part-time tuna fishing license rights have doubled in value, from \$5,600 to over \$10,000. It appears that this rising market will continue.

Since the Japanese Government is not granting any new tuna fishing licenses, the only way to secure replacement tonnage and build a new boat is to buy out the tonnage of someone who already holds a license. (Nikkan Suisan Tsushin, June 5, 1959.)

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JAPANESE-MOROCCAN COMPANY TO TRAWL FOR SHRIMP AND BOTTOM FISH IN SOUTH ATLANTIC:

A large Japanese company has formed a joint enterprise (capitalized at 30 million yen, about US\$83,000) on a $2\frac{1}{2}$ -year contract with Moroccan interests to trawl for shrimp and bottom fish in the South Atlantic. The vessel which is to do the fishing, the 499-ton No. 16 Taiyo Maru, with a crew of 21, sailed from Shimonoseki on June 15 for Morocco via Capetown. At the request of the Moroccan Government, seven Moroccans will be taken aboard the ship for training. If the venture is successful, the Japanese company will send another trawler to the Tangiers base within the year. Plans call for annual landings of about 1,500 tons of snapper and cod, to be sold through an Italian firm. (Nikkan Suisan Tsushin, June 18, 1959.)

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MORE JAPANESE FISHING TRAWLERS TO OPERATE OFF NORTHWEST AFRICAN COAST:

A Japanese fishing company was due to send the trawler Uji Maru (536 gross

tons, 900 hp. and 10 tons freezing capacity) early in July to Piraeus, Greece, where she will be based for trawling operations off Northwest Africa for two years. Plans envisage 40-day trips producing about 180-200 metric tons of bottom fish. This vessel will land its catches in Greece for consumption in that country.

A second Japanese trawler (Tatsuta Maru, 543 tons gross) that has been fishing in the Persian Gulf out of Abadan, Iran, left Abadan for Greece about the middle of June. This vessel, under a one-year contract to a Greek firm, will also fish off the Northwest African coast.

The Japanese vessels are expecting to sell their catches at US\$225-280 a metric ton, about the same price for similar fish in Japan.

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SWISS ASK FOR TECHNICAL COOPERATION TO PRODUCE TUNA PRODUCTS:

A firm established in Boston in January 1957 by a large Japanese company primarily to process tuna products (tuna franks, smoked loins, etc.) has aroused interest in Europe. Recently Swiss and British interests have approached the same Japanese company that set up the Boston firm for business arrangements similar to the Boston formula. The Swiss are particularly interested, and the Japanese company will shortly detail an investigator from Boston to Switzerland to consider concrete plans. The Swiss request is for tuna-processing facilities and technical guidance. It is thought that if this plan materializes, it will naturally be necessary to operate tuna vessels in order to assure the supply of raw material. (Nikkan Suisan Tsushin, June 18, 1959.)

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NEW TUNA VESSEL TO FISH IN INDIAN OCEAN:

A Japanese company's new tuna vessel Horyu Maru sailed on June 18 from Misaki for her maiden voyage to the Indian Ocean fishing grounds. The vessel

which will be at sea about 75 days, was completed June 12. It is 36.4 meters (119 feet) long and her gross tonnage is 238. Fish hold capacity is 230 cubic meters and fuel tank capacity is 140 cubic meters. A 650-horsepower supercharged Diesel pushes her at 11.6 knots maximum. The vessel has two ammonia compressors, one of 23.5 refrigeration tons and the other of 19.2 tons. She is equipped with radar, radiodirection finder, and radio buoys. (Suisan Keizai Shimbun, June 19, 1959.)

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BERING SEA TRAWLER ACTIVITY INCREASING:

The Japanese Fisheries Agency, after careful study, has decided to license a second Bering Sea fish-meal fleet, to be operated jointly by two fishing companies. The factoryship Tenyo Maru (11,000 tons), with 20 trawlers, sailed for the fishing grounds on June 19, where she will join another fleet, which pioneered this type of operation in 1958. The two fleets are expected to produce a total of 21,500 metric tons of fish meal and 3,800 tons of fish solubles, as well as large quantities of liver and body oils and frozen products. The Fisheries Agency has been taking a cautious attitude toward any rapid expansion of this new fishery, but the entry of large Soviet fleets into the grounds and the consequent need for Japan to stake a large and early claim on the resource are reported to have been factors influencing the granting of the new license.

According to plans, the <u>Tenyo Maru</u> will produce 8,000 tons of <u>meal</u>, 250 tons of liver oil, 1,500 tons of fish solubles, and 500 tons of fish oil and will return at the end of November.

The company operating the original fish-meal enterprise in the Bering Sea finally is making money at it. This first fish-meal factoryship fleet is expected to produce 13,500 tons of meal, 400 tons of liver oil, 2,300 tons of solubles, 800 tons of body oil, and 4,250 tons of frozen products.

Large trawlers producing frozen flatfish have also been active lately in the Bering Sea. The 1,489-ton No. 51 Taiyo Maru left the fishing grounds June 7 with

about 1,000 tons of frozen sole, and a second 993-ton trawler Asama Maru arrived in Nagoya on June 14 with 612 tons of frozen sole produced in Bristol Bay since May 12. The demand for frozen flatfish has been strong in Japan in recent years, and current prices are reportedly 10 to 20 percent above last year.

The Asama Maru reported working for about one week in company with a large Soviet fleet in Bristol Bay. The Russian fleet appeared to include two 7,000-ton tenders, two 2,000-ton stern trawlers, and about 30 trawlers of over 200 tons.

As usual, the Japanese were struck with the presence of women aboard the Soviet vessels. It appeared to the Asama Maru's fishermen that the Soviet nets were small and that their trawling techniques were not very advanced. The Japanese reported that the Russians played music and waved in a very friendly fashion when Japanese boats approached. (United States Embassy in Tokyo, June 19, 1959.)

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CANNED FISH TO BE INCLUDED AGAIN IN BURMA REPARATIONS:

It has been reported that the Burmese Government is seeking to have canned fish included in reparations goods this year for the third year. The Japanese Fisheries Agency, Foreign Ministry, and Ministry of International Trade are agreeable if the quantity is about half of that supplied last year and the year before. Chances are good that the matter will be decided as soon as a formal request is received from the Government of Burma.

The problem is obtaining agreement between the sardine and mackerel-pike export packers. Last year the whole amount was mackerel-pike, whereas the year before it was half mackerel-pike and half sardine. The sardine export packers association is determined to supply at least half of the shipments this year. Although the current price of sardines is slightly higher than that of mackerel-pike, it is thought that the Burmese can be induced to accept sardines if the

Japanese can settle their differences. The mackerel-pike canners do not think, however, that the sardine canners will get half of the order, in view of the price differential and that the entire quantity should be mackerel-pike, if the Burmese so desire. The mackerel-pike canners are already counting on filling the whole 40,000-case quota with mackerel-pike. (Nikkan Suisan Tsushin, June 5, 1959.)

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TRADING COMPANIES OPPOSE RAIN-BOW TROUT CONTROL SYSTEM:

The large Japanese company, which handles more than half of all rainbow trout exports to the United States, early in June called together representatives of seven trading companies to get their opinions on the problems of controlling trout exports and to make a start toward stabilizing prices. None of the seven companies showed any positive interest in such controls.

Because of excessive inventories and strong competition from Danish fish, the export price of rainbow trout is at the low level of 32-33 U.S. cents c.i.f United States. The large Japanese company wants to stabilize the market through an export-control formula, but the other traders are opposed on the grounds that unless the present situation of overproduction is fundamentally corrected, such measures will be ineffective; unless overproduction is corrected, measures should be taken to increase exports rather than to restrain them; if Japan imposes quantitative restrictions, only Denmark will benefit. (Nikkan Suisan Tsushin, June 9, 1959.)

SURVEY OF EARNINGS BY JAPANESE FISHERMEN:

The Japanese Shizuoka Prefecture Federation of Fishermen's Credit Cooperatives has recently made a survey of the income of 21,097 fishermen's families belonging to 70 cooperative associations in the Prefecture. It found that the average annual income per family was 619,000 yen (US\$1,733), of which 85.2 percent was from fishing and 14.8 percent from other activities, such as farming, home crafts, or day labor. Of this gross income, on

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the average, 51.2 percent was spent for expenses directly related to fishing and 39.2 percent for living expenses.

Average expenditures for living expenses per family were 242,000 yen (US\$677), as compared with a figure of 382,000 yen (US\$1,070) found in a recent survey of urban workers' families, but it was believed that fishermen's families receive a considerable unrecorded income in the form of goods. The Shizuoka fisherfolk were found to save on the average 0.6 percent of their income.

Shizuoka ranks fourth among the prefectures of Japan in total landings and is the leading prefecture for tuna landings (Suisan Keizai Shimbun, June 14, 1959).

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NORTH PACIFIC WHALING TRENDS:

The Japanese North Pacific factoryship whaling season has started off well Another sperm whale fleet, with a 1,300 head catch limit, had taken 402 whales to June 15. This is an average catch per day of 21 whales, as compared with last year's average of 23 per day. The industry has been seeking an increase in the sperm whale catch limit, and the fisheries trade press reports that the Japanese Fisheries Agency has decided to raise the limit from 1,500 head to 1,800 head, on condition that the industry accept a limitation of the coastal sperm whale catch to 2,000 head, as the Agency considers that both fisheries are exploiting the same stock of whales.

Coastal whaling from land stations in northeastern Japan is reported very good this year, with a total of 720 head taken since January 1 by the five companies engaged in whaling. Of this catch, 383 are sei whales, 322 sperm whales, 13 fin whales, and 2 blue whales. Sei whale abundance is said to be the highest in 15 years. The whalers think that the whales appearing off northeastern Japan this year are not of the Bonin Islands stock, as the



for the baleen whale fleet, but sperm whale catches are running slightly behind last year. One of the whaling fleets, which began whaling on May 28, had taken up to June 15 a total of 222 blue-whale units, 87 more than last year at the same period. Humpback whales are reported especially abundant, and are averaging 62.26 feet long, as compared with 61 feet last season. This fleet expected to reach its catch limit of 800 blue-whale units by mid-August, at the latest.

grounds, which ordinarily would be about 270 miles off the coast at this season, are still within 200 miles of shore, the United States Embassy in Tokyo reported on June 19, 1959.

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FISHERY NOTES FROM TRADE PRESS IN JUNE:

A cold storage plant for tuna is to be set up in Ceylon by a Japanese-Ceylonese company.

The Japanese Maritime Safety Board arrested 27 vessels in April and May for unlicensed tuna fishing.

Taiwan is negotiating with the United States Government for a loan to build 4 to 6 refrigerated tuna fishing boats of 200-300 tons.

The Japanese Export Tuna Canners Association has asked the Fisheries Agency to clamp down on direct exports of tuna to Cuba, transshipments from the Atlantic to the United States, and plans for canning tuna in Malaya, and has asked the Government to negotiate with the United States to set up a special Japanese quota within the United States canned-tuna-in-brine import "global quota."

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AGAR-AGAR INDUSTRY TRENDS:

Prices in June 1959 on the international market for agar-agar continued high as the supply was short because of poor

Table 1 - Japanese Agar Production, 1956-1959							
Year	Natural Agar	Natural Agar Factory Agar					
	(1,000 Lbs.)						
1959	3,670	800	4,466				
1958	3,666	550	4,511				
1957	3,961	650	4,038				
1956	3,388	n.a.	n.a.				

production in Japan and Korea. Last year's warm winter in those two countries, which are producers of natural agar for export, has a strongly adverse effect on production. In the case of Japan, the unusually warm weather during the producing season, which extends from December to March, resulted in the production of considerable poor quality agar. As a result, total production in the 1958/59 season was only 1,664 metric tons, 20 percent less than the planned 1,910 tons. Korea also had a warm winter, and according to trading company sources, that country's production, which in the past has been about 800,000 pounds, was only 300,000-400,000 pounds. Because of this marked drop in production, the price of natural agar, which had been as low as US\$1.15 a pound f.o.b. around the first of the year, rose sharply after the first of

March and is now around US\$1.45 per pound f.o.b. Japan.

The Ministry of International Trade and Industry announced on May 28 that \$400,000 in foreign exchange would be allocated for the importation of about 330,000 pounds of Korean agar. Applications for foreign exchange were accepted up to June 1, and qualifications for applicants were: (1) Those who have exported \$200,000 or more worth of agar between January 1, 1957, and the end of December 1958. (2) Those who imported at least \$50,000 worth of agar during the same period. (3) Those who will reprocess the imported agar into powder and re-export it.

Before World War II agar was exported to many countries of the world as a special product of Japan. Because the price of gelidium seaweed rose since the war, and because some of the former importing countries started producing agar during the war when Japanese exports were cut off, exports from Japan have been declining year by year.

Therefore, in recent years Japan has been importing comparatively cheap agar from Korea, reprocessing it, and re-exporting it, as a policy designed to keep export markets. If exports die out, large quantities of agar will be thrown on the domestic market, leading to a drop in price, and the policy is also intended to prevent this. Hitherto the re-export trade has been carried on by sorting and fixing up the Korean agar in bonded warehouses, without paying duty, but because this has led to problems of quality, study is being given to mixing the imported agar with some quantity of domestic material and re-exporting it in powdered form. For this purpose \$50,000 was added to this year's allocation as an experimental quota. (Suisan Keizai Shimbun, May 29, 1959.)



Kore a

SHRIMP PRODUCTION AND FOREIGN TRADE:

Landings of shrimp in Korea in 1958 amounted to 35.9 million pounds, valued at 746.6 million hwan (US\$1.5 million), a drop of 20.7 million pounds from the preceding year, but about the same as the average (33.0 million pounds) for the three-year period 1954-1956. About 70 percent of the landings consist of shrimp over 200 count

Korea (Contd.):

Table 1 - Korea's Landings of Shrimp and Exports of Dried Shrimp, 1954-1958

Direct Shiring, 1307-1300						
Year	Land	lings	Ex	ports		
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000		
1958	3,592 5,658 3,786 3,113 3,049	1,493 1,686 1,451 935 935	21 701 30 168 190	13 90 17 51 59		
Note: Values converted at rate of 500 hwan equal US\$1.						

to the pound (1/4-inch in length), 20 percent shrimp 100-200 per pound, and the balance less than 100 shrimp to the pound. The smallest shrimp are brined and dried for the domestic trade and for export. Only those shrimp of the size 100 count or less are frozen for export.

Exports up to 1958 were practically all dried shrimp, except for some shipments (48 tons in 1954) of fresh shrimp to Japan. Although no data on fresh shrimp shipments have been maintained since 1954, it is believed this small-scale trade continues. The exports of dried shrimp between 1954 and 1958 varied between a high of 318 metric tons in 1957 to a low of 9.5 tons in 1958. In 1958, the first shipments of frozen shrimp were made to the United States--129,000 pounds valued at US\$73,400. In the first three months of 1959, 18,000 pounds of frozen shrimp were exported and it is estimated that shipments through April 1959 totaled 30,000 pounds. The development of a frozen shrimp export trade has been aided by the United States International Cooperation Administration Mission to Korea.

The United States is the only country to which Korea ships frozen shrimp, (United States Embassy in Seoul, June 5, 1959.)

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UNITED STATES LOAN FOR SMALL BUSINESS INCLUDES FISHING INDUSTRY:

The United States Government on July 9, 1959, announced that the Development Loan Fund has given basic approval and commitment of funds for a loan of US\$5 million to the Korea Reconstruction Bank, owned by the Government of Korea, to help finance loans to small private enterprises for the foreign exchange costs of machinery, equipment, and services. Details of the loan agreement are to be negotiated.

Fishing is included among the principal industries which the Bank expects to help with the funds.



Mexico

MERIDA SHRIMP FISHERY TRENDS, JUNE 1959:

The financial crisis which the shrimp industry of the Campeche area faced at the end of the first quarter of 1959 has been partially, but not totally, relieved. The relief came primarily from the lifting of the three-months ban on the catching of white shrimp. Since the ban was lifted on June 1, 1959, production, while not spectacular, has been better than the average for the previous six months. If the present volume of production should continue, it would go far in relieving the indebtedness which has been crippling the boat owners.

Financial help has been sought from the Nacional Financiera in Mexico City which sent a representative to study financial conditions. The press reported that the representative left Campeche with a favorable report and that he indicated that the loans, totaling five million pesos (US\$400,000), requested by the Campeche boat owners, would probably be granted, the United States Consul in Merida reported on June 30, 1959.

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NEW FISH MEAL PLANT ESTABLISHED IN CARMEN:

A fish meal plant has been completed in Carmen and the latest modern equipment has been installed. The plant has purchased two fishing boats and expects to catch at least 80 tons of fish a day-the minimum needed to break even. Surveys conducted in the area with the help of experts from the United States indicate that this quantity of fish is available. The plant's operations, however, are bogged down at the moment by Government red tape regarding the registration of the boats and import tariffs on them (United States Consulate in Merida, June 30, 1959).



Morocco

SARDINE VESSELS STOP FISHING:

The owners of the Moroccan sardine fishing fleet of Safi on June 11 stopped

Morocco (Contd.):

sending out their vessels to the fishing banks. They gave two reasons for their action. First, the sardine canneries have practically ceased working because of the surplus of unsold sardines on hand, estimated at 1.2 million cases. Second, they claim that the Fisherman's Union (Federation des Marins-Pecheurs) has insisted on naming the master fisherman on each ship while the owners insist on retaining the right to hire their own masters. The union has denied that it has attempted to name the master fishermen and says this is only an additional excuse for the owners to stop fishing. The number of vessels idle is about 120, employing over 2,500 fishermen. The Minister of Labor is trying personally to solve the work stoppage. One avenue being explored is the possibility of temporary subsidies to canneries, according to a June 18 report from the United States Embassy in Rabat.



Netherlands

FROGMEN STUDY TRAWL-NET FISHING:

Working with the Netherlands Institute for Fishery Research at Ijmuiden, Dutch frogmen for the first time have observed the reaction of fish along the sea bed as they are caught in the nets of a trawler. The study was carried out on the sea bottom by four amateur frogmen, at a depth of between 50-60 feet, 12 miles northwest of Ijmuiden on the Dutch coast.

The most surprising result of the study, according to the Institute, was the discovery that about 20 percent of the fish caught escape through the meshes when the trawl is drawn up from the sea bed. The frogmen also reported that flatfish did not move until the trawl was only about six inches away and then swam upwards to try to keep ahead of the net. The fish usually gave up this effort after about 30 seconds.

Owing to the success of the tests and the amount of study material produced by them, plans are now being made to train frogmen for work exclusively with the Institute during which underwater cameras will be used. (United States Embassy at The Hague, June 25, 1959.)



Norway

FISHERIES PROJECT IN INDIA TO BE CONTINUED:

The Norwegian press on June 1, 1959, reported that the Norwegian Parliament had voted a five million kroner (about US\$700,000) grant for the Indo-Norwegian Fisheries Project in Kerala State near Quilon. This grant is for the year 1959/60. A similar grant of five million kroner was voted this time last year for 1958/59.

A four-hour debate is reported to have preceded the voting, when opposition members spoke against the appropriation. They preferred to cancel the allotment for the fisheries project in Kerala and to increase instead the Norwegian contribution to the United Nations special fund for technical and economic development. The Norwegian Foreign Minister who visited the project in Kerala in November last year stated, according to the press report, that "we cannot let our efforts be transferred to the United Nations organ until our work has reached a conclusion we can be satisfied with."



A prototype boat developed in India by Food and Agriculture Organization naval architects. This boat was developed to replace catamarans, used by thousands of fishermen in India along stretches of surfbeaten coasts with no harbors.

Earlier reports which originated from Oslo and appeared in the local press stated that the Foreign Affairs Committee of the Norwegian Parliment presented a report on the progress of the Project dated May 27, 1959. The Indo-Norwegian Fisheries Project in Kerala, according to

Norway (Contd.):

this report, has achieved "valuable results" in the face of considerable difficulties. There had been success in all sectors of the project: fishing, water supply, and health. But the report also indicated several "setbacks," including a lack of motor boats for inshore fishing and boats built of Norwegian timber were damaged by Marine borers, the United States Consulate in Madras, India, reported on June 15, 1959.



Pakistan

FISHING EQUIPMENT IMPORTED THROUGH COOPERATIVES EXEMPT FROM DUTY AND SALES TAX:

On April 12, 1959, the Pakistan Central Board of Revenue with the sanction of the Central Government in a press release announced the exemption of certain fishing requisites from Customs duty and sales tax if imported through the Karachi Fishermen's Cooperative Purchase and Sale Society, Ltd., Karachi; and in the case of East Pakistan if imported through the Director of Fisheries, East Pakistan.



Dried shark is produced in Pakistan for export to other Oriental countries. Pakistanis prefer fresh fish.

The ad valorem rates of duty normally charged for some of these items (all subject to a ten percent sales tax in addition to duty) are: marine Diesel engines and spare parts, 10 percent; nylon ropes, 30

percent; nylon twine, $37\frac{1}{2}$ percent; coir ropes, 36 percent; fish hooks, 80 percent; spongex floats, 60 percent (from United Kingdom, 50 percent); navigational instruments, 60 percent (from United Kingdom, 50 percent); and lead sinkers, 40 percent.

The Central Board of Revenue, Ministry of Finance, stated that although no official notification regarding exemption from Customs duty on the above items has been issued, executive instructions setting forth the procedures for granting the exemptions have been forwarded to the Customs authorities.

An official of the Pakistan Department of Fisheries stated that the International Cooperation Administration authorities had requested exemption from Customs duty sometime ago. The same official stated that the Karachi Fishermen's Cooperative generally takes care of about 95 percent of the requirements of fishermen in Karachi. This Cooperative generally obtains import licenses on the basis of recommendations made by the Pakistan Central Fisheries Department. For the last three years or so the fishing community has been purchasing its requirements from the Cooperative. While fishing requisites could come in under the operations of the Export Bonus Scheme, such imports, in view of the above executive order granting exemptions, could certainly not compete with the Karachi Fishermen's Cooperative Society.

The same official in the Pakistan Central Fisheries Department stated that they have urged the Central Board of Revenue to grant Customs exemptions for all items imported by the Fisheries Department under the Colombo Plan, ICA assistance program, and other foreign aid programs. (United States Embassy in Karachi, May 15, 1959.)

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FREEZING AND PROCESSING PLANTS BEING BUILT:

Only two firms, both located in Karachi, are now engaged in the export of frozen and canned shrimp. One firm maintains a plant having a freezing capacity of $4\frac{1}{2}$ tons daily, and cold-storage facilities

Pakistan (Contd.):

of 40 tons capacity. The other firm has a freezing capacity of 6 tons daily, and cold-storage facilities of 1,250 tons capacity. Both companies have expressed an interest in expanding their operations through United States investment participation.

Two additional plants, both in Karachi, are scheduled for completion in January 1960. These companies also are interested in American investment participation.



Dried shrimp shells ground and bagged for use as fertilizer. Produced in Pakistan for export to Ceylon.

The Bay of Bengal in East Pakistan reportedly offers an excellent potential for the development of a fishing industry. No freezing and cold-storage plants are operating in East Pakistan at present; however, two are under construction. The first, located at Chalna, will have a freezing capacity of 5 tons daily, and cold-storage facilities of 200 tons capacity. The second, at Chittagong, will be able to freeze $2\frac{1}{2}$ tons daily and store 50 tons.

To encourage the further development of the fishing industry, the Government of Pakistan is prepared to grant certain concessions to investors establishing new enterprises, and/or collaborating with existing firms. Among others, these include loans through the Pakistan Indus-

trial Development Corporation (PIDC) for local construction and other costs, and an export bonus scheme which provides that exporters of frozen or canned fish will be entitled to receive bonus vouchers equivalent to 40 percent of the f.o.b. Karachi value of the exported products. These vouchers may be used toward the import of construction items, machinery, engines, etc. (Foreign Commerce Weekly, June 22, 1959.)

Philippines

CANNED FISH RETAIL AND WHOLESALE PRICES, JUNE 16, 1959:

Retail and wholesale prices on June 16, 1959, for canned sardines and canned salmon in Manila were:

Product	Wholesale US\$/cs.	Retail US¢/can
Canned sardines:	(48 15-oz. cans)	
U. S. brand	12.00-12.625	27.5-32.5
Japan brand	12.00	25.0-30.0
Canned salmon:	(48 16-oz. cans)	
U. S. brand	29.75-30.00	67.5-75.0
Japan brand	29.75-30.00	67.5-75.0

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CANNED SARDINE PRICES:

According to a large Philippine trading company, the following informal acceptance of bids on canned sardines was made at the opening of tenders for canned fish by the Philippines purchasing agency on May 8, 1959.

O No. 1 intomato sauce: Japan, 21,250 cases (\$7.70); U. S., 22,500 cases (\$7.98-8.14); South Africa, 10,000 cases (\$7.60)--total 53,750 cases.

O No. 3 in tomato sauce: Japan, 18,750 cases (\$9.05).

Buffet cans in tomato sauce: Japan 16,124 cases (\$4.25); South Africa, 12,000 cases (\$4.25)--total 28,124 cases.

Small No. 1 cans, tomato sauce: U. S. 3,750 cases (\$7.36); South Africa, 3,750 cases (\$6.60)--total 7,500 cases.

No. 4 cans, natural: U. S., 16,500 cases (\$6.18-\$6.72); South Africa, 3,250 cases (\$5.70)--total 19,750 cases.

Philippines (Contd.):

It appears that as a result of negotiations, the Japanese canned fish bids accepted at the purchase on May 8 have been increased to 23,000 cases each for O No. 1 and No. 3's, and to 19,400 cases for buffet cans. (Nikkan Suisan Tsushin, June 2 & 4, 1959.)



Portugal

CANNED FISH EXPORTS, JANUARY-MARCH 1959:

Portugal's exports of canned fish during January-March 1959 amounted to 17,018 metric tons (937,000 cases), valued at US\$8.7 million, as compared with 12,000 tons, valued at US\$6.8 million, for the same period in 1958. Sardines in olive oil exported during the first 3 months of 1959 amounted to 12,543 tons, valued at US\$6.2 million.

Table 1 - Portuguese Canned Fish Exports, JanMar. 1959						
Species	JanMar. 1959					
	Metric	US\$				
}	Tons	1,000				
Sardines in olive oil	12,543	6, 158				
Sardine & sardinelike fish in brine	509	102				
Tuna & tunalike fish in olive oil	609	443				
Anchovy fillets	1,593	1,134				
Mackerel in olive oil	1,361	664				
Other fish	403	154				
Total	17,018	8,655				

During January-March 1959, the leading canned fish buyer was Germany with 4,114 tons (valued at US\$2.0 million), followed by Italy with 1,984 tons (valued at US\$1.1 million), the United States with 1,527 tons (valued at US\$1.1 million), Great Britain with 1,497 tons (valued at US\$712,000), and Belgium-Luxembourg with 1,471 tons (valued at US\$719,000). Exports to the United States included 803 tons of anchovies, 45 tons of tuna, 645 tons of sardines, and 18 tons of mackerel. (Conservas de Peixe, May 1959.)

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CANNED FISH PACK, JANUARY-MARCH 1959:

The total pack of canned fish for January-March 1959 amounted to 4,286 metric tons as compared with 3,921 tons for the same period in 1958. Canned sardines

Table 1 - Portuguese Canned Fish Pack, JanMar. 1959								
Product	Metric Tons1/	1,000 Cases						
In olive oil: Sardines	1,907 4 203 1,829	100 - 7 182						
Mackerel	4 340	- 17						
Total	4,287	306						

in oil (1,907 tons) accounted for 44.5 percent of the January-March 1959 total pack, lower by 4.4 percent than the pack of 1,994 tons for the same period of 1958, the May 1959 Conservas de Peixe reports.

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SARDINE FLEET SAILS AFTER SETTLEMENT OF CONTRACT DISPUTE:

The Portuguese sardine fishing fleet at Matosinhos put to sea on June 21, 1959, following the settlement on June 20 of a long-standing dispute between the ship owners and fishermen. Under the new agreement the crewmen of the small motor vessels will receive a percentage share of the gross value of the catches based on a sliding scale. The new contract provides that the fishermen will receive a minimum of 32 percent of a fifteen-day catch valued at US\$1,050 or less--the percentage increasing proportionately to a maximum of 40 percent for catches valued at more than US\$7,000.

According to press reports the first day's fishing was successful, fine fish being landed and valued at about US\$20,400. (United States Embassy dispatch from Lisbon, dated June 25, 1959.)



South-West-Africa

FISHERY LANDINGS AND PRODUCTION, 1958:

During 1958 the fishing industry of South-West Africa generally maintained its catch at the level of previous years. The production of canned fish set a record. Unfavorable weather, however, caused a substantial reduction in the stock of spiny or rock lobster catch, although landings improved considerably in the first months of the present season.

South-West Africa (Contd.):

Table 1 – South-West Africa Landings and Products of Principal Fisheries, 1958						
		Products		Produced1/		
Fishery	Landings	Fmzen	Canned	Fish	Fish	
					Body Oil	
	Short	1,000	1,000	Short	Short	
1958:	Tons	Lbs.	Lbs.	Tons		
Pilchard	252,556	-	112,845	46,200	11,858	
Spiny lobster	4,449	1,777	430	941	-	
Snoek	1,682	-	-	-	-	
White fish	1,648	-		-		
1957:						
Pilchard	250,757	-	85,676	46,768	10,793	
Spiny lobster	8,434	1,374	1,808	1,685	-	
Snoek	3, 125	-	_	-	-	
White fish .	2,066					
1/ Product weight						

(The South African Shipping News and Fishing Industry Review, May 1959.)



Spain

VIGO FISHERIES TRENDS, APRIL-JUNE 1959:

Fish Exchange: Landings of fish in the April-June 1959 quarter at the Vigo Fish Exchange totaled 15,165 metric tons, an increase of 68 tons over the preceding quarter and up 3,002 tons from the same period in 1958. Small hake and horse mackerel were the leading species landed at Vigo Exchange in the April-June 1959 period. The 1959 sardine season opened on April 15 and landings in May amounted to 587 tons as compared with 442 tons in May 1958. However, June 1959 landings were lower by 319 tons from the 524 tons landed in June 1958. The albacore tuna fishing season was off to a good start in June this year with 661 tons sold over the Vigo Exchange--only 169 tons passed through the exchange in June 1958. But low prices for albacore tuna because of light demand were considered too low by the fishermen for profitable fishing. Fishermen are recommending the export of frozen albacore be studied as an alternative to selling to Spanish canners.

The April-June 1959 landings were valued at US\$4,086,000 (at the official rate of US\$1.00=42 pesetas), about 5 percent above the value for the preceding quarter and 30.7 percent higher than for the second quarter of 1958. Albacore exports of canned fish was due to see vere competition from Japan, Portugal and Yugoslavia, increasing competition from Morocco, and the development of strong fish canning industry in Peru. It ports of canned albacore to the United

vessel prices averaged 10 U.S. cents a pound in June this year. The much lower ex-vessel price for this June was attributed to the heavy inventory of canned white meat tuna carried over from the 1958 season.

Fish Canning and Processing: Fish bought for canning in April-June this year amounted to 1,656 tons--up 1,073 tons from the January-March 1959 quarter and 300 tons over the same quarter in 1958. The better landings of albacore tuna at lower ex-vessel prices helped the canners off to a good start for the packing of white meat tuna. But, the drop inlandings of sardines in June this year was the cause of some worry to the canners. Olive oil was plentiful and reasonably priced, but tinplate stocks were limited to a two months supply as the quarter ended.

Fish Meal: In early April, the Economic Council of the Fisheries Byproducts group of the National Fisheries Syndicate met to discuss the production of fish meal. Because of the continued demand for fish meal, the Council decided that import licenses for fish meal would not be granted until the Syndicate certifies that the national production cannot meet the demand. It is estimated that Spain consumes about 40,000 tons of fish meal yearly while Spanish production is about 30,000 tons. Plant capacity is sufficient to process more than this total, but the supply of raw material is inadequate. In 1958 it was estimated that 2,160 tons of fish meal were imported to partially make up the deficit in the supply of fish meal.

Exports of Canned Fish: Export licenses for exports of canned and salted fish in 1958 totaled 28,320 tons. Important items exported in 1958 included 822 tons of canned sardines in oil, 1,358 tons of canned anchovies in oil, 9,733 tons of salted anchovies, 1,310 tons of canned tuna in oil and brine, 1,526 tons of canned bonito in oil, and 12,200 tons of dried fish. Although exports of all fishery products rose about 25 percent from 1957 to 1958, canned fish exports were lower. The drop in exports of canned fish was due to severe competition from Japan, Portugal, and Yugoslavia, increasing competition from Morocco, and the development of a strong fish canning industry in Peru. ExSpain (Contd.):

States were up about 19 percent in 1958 from the preceding year. Canners were worried about the continuing decline in the exports of anchovies in oil--1958 exports of this item were down 35 percent from the 1956 exports.

In 1958, Italy was Spain's principal customer for canned and dried fishery products with imports of 8,794 tons, followed by the Belgium Congo with 8,043 tons, French East and West Africa 2,379 tons, and Ghana with 1,186 tons. The United States with imports of 1,013 tons was Spain's sixth best customer in a list of about 53 countries that imported canned and dried fish in 1958.

Exports of fishery products other than canned and salted fish (includes live, fresh, frozen, iced, agar-agar, and some byproducts) amounted to 1,646 tons in 1958.

Imports of Fishery Products: In 1958 out of a total of 22,520 tons imported under import licenses, 18,346 tons were salt cod, 2,160 tons were fish meal, and 860 tons were fish oil.

The Canners' Group of the National Fisheries Syndicate, as a result of a study, has recommended the following measures to increase exports:

- A. To those countries which have been habitual importers of Spanish canned fish:
 - (1) Raise the export premium from 8 pesetas to 13 pesetas on the dollar, i.e., 55 pesetas for the dollar.
 - (2) Eliminate minimum sales prices established by the Government.
 - (3) Increase foreign reserve holdings of exporters from 20 to 50 percent.
 - (4) All foreign exchange produced to be converted and carried as a peseta account from which export licenses could be requested.
 - (5) Automatic concession of licenses by regional delegates of com-

merce with 50 percent of exchange earnings devoted to the needs of the canners and related industries.

- B. Global exports to non-habitual consumers of Spanish-canned fish:
 - (1) One-time offer to the United States of 30,000-50,000 cases of white meat canned tuna in brine.
 - (2) Study of similar operations in canned anchovies for export to the United States and canned sardines to eastern Europe.

With the devaluation of the peseta in July, the exporters of canned fish found most of their recommendations automatically accepted. Of course, the processors will have to pay for imports at the devalued rate, but on the whole the devaluation of the peseta should be beneficial to the fish-processing industry.

Fishing Industry Loans: Aloan passed in December 1957 contained a provision for granting credits of about 250 million pesetas (about US\$6 million at rate of 42 pesetas equal US\$1) over a threeyear period for construction of fishing vessels and loans to processors. No provision was made to implement the loan by establishing the funds needed for the loan program. Another loan has been proposed to establish a credit of 1,000 million pesetas (about US\$23.1 million) for rehabilitation of the fishing fleet over a five-year period. Fishing vessel owners are now pessimistic about the passage of this loan due to the Government's campaign to decrease spending.

Greenland Territorial Waters: Several fishery publications have expressed alarm at the prospects of Denmark extending its territorial waters in Greenland as it did in the Faroe Islands. Because Spanish fishing vessels were shut off from Iceland and the Faroe Islands, they have been concentrating off the shores of Greenland and Newfoundland.



Sweden

LOAN FUND FOR FISHERMEN INCREASED:

The Swedish Riksdag recently made 5 million crowns (US\$965,000) available for loans to fishermen in addition to the 3.8 million crowns (US\$733,000) which have been placed in the loan fund for the present fiscal year.

Special provisions apply regarding the supplementary loans, since these funds have been granted to assist the smaller shipyards specializing in the construction of fishing boats, which otherwise would be without work. Therefore, loans are only granted for the acquisition of, or rebuilding of fishing boats, or for the installation of new motors.

The final regulations governing the loans are not yet available, but it is stated they will include the following terms:

The maximum loan total is SKr. 150,000 (US\$28,950), however, loans for acquisition of new fishing boats may not exceed 80 percent of the purchase price.

The loan is available when the boat has been delivered, rebuilt, or provided with a new engine and when a classification company has furnished a certificate of approval, or when the borrower in some other way presents evidence that the boat is in the condition that was stipulated when the loan was granted.

The loans are free from amortization or interest for two years and must thereafter be repaid within 10 years, with equal payments each year plus interest. Upon the expiration of the interest-free period, interest is paid at the rate of 4.25 percent.

Sureties in the form of mortgages with priority rights shall be executed. With regard to loans granted for acquisition of new fishing boats, the mortgages shall cover at least the amount of the loan granted, while mortgages for loans covering rebuilding of fishing boats or installation of new engines, shall be within 80 percent of the actual value of the boat after the improvement.

The fishing boat shall be insured against partial damage as well as total loss at a value determined by the Fisheries Board. In certain cases the Fisheries Board may authorize the owner to stand a self-risk of 10 percent of the insurance value in case of total loss and 20 percent in case of other damage.

Other terms are as follows:

Extensive alteration of the fishing boat is subject to prior approval by the Fisheries Board.

Sureties shall be valid for the borrower's total obligations against the loan fund.

The Fisheries Board has the right to arrange for a survey or valuation of the boat during the loan period.

Charges for such surveys or valuations, or mortgage arrangement shall be paid by the borrower.

The Fisheries Board shall be informed immediately of any change of the ownership of the boat.

It is the responsibility of the insurance company to give the appropriate governmental authority notice before taking any action to change or cancel the insurance on a boat at the request of the owner.



Tunisia

EIGHT TRAWLERS PURCHASED IN ITALY:

On July 15 the Director of the Tunisian National Office of Fisheries returned from Italy, where he awarded contracts for the building of four modern trawlers which eventually will be operated by the Office of Fisheries. The trawlers are expected to be completed early in 1960. In addition, four second-hand trawlers were bought.

The purchase of the trawlers is part of a United States Overseas Missionsponsored project for the improvement of the Tunisian fishing fleet. The new Tunisia (Contd.):

Italian craft will be commanded initially by skilled, foreign (but not necessarily Italian) officers who will teach Tunisian apprentices how to run the vessels. It is estimated that with good maintenance the total annual catch of the four vessels will be about 750 metric tons, which will increase the present total Tunisian trawler catch of 2,500 tons annually by almost a third.

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TUNA CANNERY TO REPLACE PORTUGUESE LABOR:

Portuguese labor at the tuna cannery of Sidi Daoud on the northwest shore of the Cap Bon peninsula, Tunisia, will be replaced next year by Tunisian workers, according to the deputy director of the cannery.

The cannery employs between 400 and 500 men and women during the tuna-fishing season which lasts from about May 1 until the middle of July. Until last year about 80 of these workers were Portuguese women whose skill in packing tuna into cans made the payment of their passage from Portugal worthwhile. This year only 20 Portuguese women were employed, and an attempt was made to teach Tunisian women the necessary skills without much success. However, in spite of the amount of fish that may be wasted, the cannery intends to employ only Tunisian women next year.

The cannery also employs two Spanish captains who command the vessels which tow smaller boats out to the tuna traps in the bay of Tunis. They, too, come only for the season, but it is unlikely that they will be replaced by Tunisian captains.

The replacement of Potuguese laborers by Tunisians and the employment of large numbers of workers by this plant, which cans most of the 900 metric tons of raw tuna taken each year in Tunisian waters, is in keeping with Tunisian policy to spread available work as widely as possible. However, wages and a large labor force have priced the products of this plant out of the French market, and sales of canned tuna, tuna roe, and other products now are almost exclusively to

the Tunisian market. The average laborer earns 500 millimes a day (about US\$1.19) and the average fishermen 1,000 millimes (about US\$2.38) a day, according to a United States Embassy dispatch (July 1, 1959) from Tunis.



Uganda

NYLON NETS AND MECHANIZATION DOUBLE FISH CATCH:

The introduction of nylon nets and outboard motors to the fisheries in the lakes of Uganda, which was started late in 1953, has already resulted in doubling the fish catch, which now amounts to some 48,500 metric tons a year.

"There are now more than 1,200 outboard motors installed in the fishing craft of the Uganda lakes," stated a Food and Agriculture Organization (FAO) expert, when he returned to FAO Headquarters after a year in Uganda surveying the fish marketing situation in the country. "This development has taken place largely as the result of the work of the Uganda Game and Fisheries Department and with no direct financial aid from the Government," he stated.

As a result of the FAO survey, the Government organized eight pilot projects, financed by the African Trade Development Fund. These projects include setting up primary fish markets, retail and wholesale markets with storage facilities, and in three remote places fish storage facilities with a shop attached to each to supply fishermen with equipment and material.

The FAO expert also proposed to the government that "feeder" roads should be built to give access to remote parts of the lakes to open up the fishing. The government has allocated £10,000 (US\$28,000) to build such a road to the southern end of Lake Albert, which is rich in fish.

"I found a flourishing fishery in Uganda," concluded the FAO expert, "and I am sure it will continue to expand rapidly once a few marketing and distribution bottlenecks are cleared away."



Union of South Africa

EXPORTS OF MARINE OILS, 1958:

In 1958 more than 4.2 million Imperial gallons of marine oils were exported by the Union of South Africa. The exports by type of product were as follows: fishbody oil, 3,800,631 gallons; fish-liver oil (includes concentrated oil), 211,587 gallons; whale oil, 211,304 gallons; and other marine-animal oils, 5,043 gallons.



U.S.S.R.

WHALING SUPER-FACTORYSHIP COMPLETED:

According to foreign news reports, the U.S.S.R. has completed the 40,000-ton whaling super-factoryship Sovietskaya Ukraina at the port of Nikolaev on the Black Sea. It is further reported that work has begun on a second factoryship of the same tonnage class. (Nikkan Suisan Tsushin, June 15, 1959.)



United Kingdom

IMPORTS OF CALIFORNIA CANNED SARDINES OPPOSED BY BRITISH COMMITTEE:

The committee of the Cornwall Sea Fisheries decided during a meeting at Truro, to approach all members of Parliament in Cornwall and ask for their support to stop imports of California canned sardines or pilchards.

The chairman said that the proposed importation might well result "in the extinction of the Cornish pilchard industry." He pointed out that there was already heavy imports of South African canned pilchards coming into the country, tariff free and in unrestricted quantities under Commonwealth preference, and a small yearly quota of £30,000 (US\$84,000) worth was coming from Japan. "Now there is every indication that Californian pilchards are to be allowed into this country. Further imports of foreign canned pilchards can only cause irretrievable damage to the pilchard fishermen of Cornwall, and will also

endanger the possible success of the White Fish Authority's scheme to revive the pilchard industry."

The chairman then went on to say that on one side research into fishing methods was being made, with efforts to improve the industry, which had for a long time been fighting a desperate battle, and on the other, the Government was increasing the competing imports. It did not make sense. He concluded by saying that the California imports could easily undercut the home product in price, and pilchards were the mainstay of the Cornish fishing industry (Fishing News, June 5, 1959).

PLAN FOR DEVELOPMENT OF PILCHARD INDUSTRY INITIATED:

Development plans of the British White Fish Authority for the Cornish pilchard industry were set in motion at Trurolate in May with the first meeting of the Pilchard Industry Development Management Committee.

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Set up by the White Fish Authority, the new committee consists of representatives from the Authority, the Ministry of Agriculture, Fisheries, and Food, Cornwall Sea Fisheries Committee, the fishermen, and canners.

During the meeting, the chairman, who is chief executive of the White Fish Authority, announced that agreement had been reached on a program in outline.

"We think it will enable us to carry out the main objectives of finding out where the pilchards are, when they can be found, and in what quantities, and we have to go on to plan the broad outline of the programme for a development unit for putting the production programme into operation," he said.

The catching and processing vessel would be a multipurpose fishing craft rather larger than the normal fishing boats in order to accommodate the additional scientific gear and extra nets.

Before the next meeting estimates will be drawn up of the capital costs of equipping the development unit, together with United Kingdom (Contd.):

an estimate of the operation cost. The White Fish Authority, the sponsoring organization, will also make plans on how the money needed will be raised (Fishing News, June 5, 1959).

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TECHNOLOGIST PREDICTS THAT FUTURE TRAWLERS WILL BE EQUIPPED WITH FREEZERS:

At the open day held at the Scottish Torry Research Station in Aberdeen, Scotland, on June 15, the superintendent of the station said he could see new methods coming along in a few years' time which would solve the problems of glut and scarcity in the fishing industry. With quality control and testing, batch-production techniques would be adopted, and, he said, "even small-scale mechanization might be expected in the treatment of fish."

The most significant proposal in this direction was undoubtedly the development of the "semi-freezer" trawler, in which high speed would be relegated to second place, and the space and capital outlay thus saved devoted to better stowage and more processing plant. In this way the voyage of a trawler of 185-190 feet might be extended by several days, with a higher proportion of better quality fish on landing at the end of the voyage.

Basing the estimates on the Northern Wave experiments of 1956, where it was found that whole headless sea-frozen cod was equal in quality to very fresh iced fish, the sponsors of the scheme conclude that it would still be necessary to stow a considerable proportion—up to two-thirds—of the fish at ice-temperature, because there still would not be sufficient space to freeze the whole catch.

The frozen part of the catch would, on the average, represent the extension of stay on the fishing grounds as compared with the normal voyage, and the iced fish would be equal to the normal catch. The average quality of landings would certainly be higher.

The advantages of this design of trawler are that it is no larger or costlier

than existing vessels and fewer vessels are needed, but the extension of the voyage is moderate, and the thawed fish can be handled by the trade in the same way as iced fish.

Among a number of interesting demonstrations which would be of value in handling the frozen portion of frozen-atsea fish was one concerned with the thawing-out of frozen fish; a di-electric thawing technique has recently been developed which reduces the thawing time of herring from the present 12 hours to 15 minutes. Large blocks of frozen cod take at present up to three days to thaw, but by the new process complete thawing can be obtained in 75 minutes.

A logical development, using this new technique, would be the establishment of thawing stations in main centers of distribution, such as London, Manchester, and Birmingham, to which hard-frozen fish could be sent for storage and subsequent thawing to provide sea-fresh fish (Fish Trades Gazette, June 20, 1959).

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TRAWLER OWNERS AGREE TO SUPPLY FISH FOR SOVIET CONTRACT:

The British distant-water trawler owners at Fleetwood, Grimsby, and Hull announced that they have agreed to supply fish to a British processing organization for the execution of a contract signed June 11, 1959, for the delivery to Russia of frozen skinless fish fillets in June, July, and August of this year. The contract, which is subject to production, is for a total of 1,000 metric tons of cod fillets. This contract is equal to onesixth of the amount sold to the Soviets in 1958. (United States Embassy in London, June 15, 1959.)



Venezuela

ESTIMATED FISHERY LANDINGS AND UTILIZATION, 1958:

Landings of fish and shellfish in Venezuela in 1958 totaled about 80,200 metric tons, of which 69,000 tons were taken in marine waters and 10,300 tons in fresh water. The landings were valued ex-vessel

Venezuela (Contd.):

at about 41.7 bolivars (US\$12.5 million). The marine landings were valued at 36.5 bolivars (US\$11.0 million) and freshwater landings 5.2 bolivars (US\$1.5 million). Included in the total landings for 1958 were 32,800 tons of sardines.

The 1958 landings were utilized as follows: 27,600 tons for fresh fish, 18,100 tons for salted fish, and 34,500 tons for canning.

Processed fishery products in 1958 included 29,900 tons of canned sardines (90.3 million cans), 3,500 tons of canned tuna, 1,100 tons of canned shellfish, and 2,400 tons of fish meal.

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SARDINE LANDINGS AND CANNED PACK, 1957:

Landings of sardines in Venezuela for canning increased sharply from 14,136 metric tons in 1956 to 26,861 tons in 1957. The 1957 sardine landings were almost 9,955 tons higher than the 16,906 tons landed for canning in 1955. Sardines are caught throughout the year, but landings are heaviest from December to June and as a rule drop off sharply in the late summer and fall months.

The sardine pack in 1957 amounted to 12,854 tons (82,533,000 cans). In 1957 sardines were packed in can sizes varying from 90-720 grams (3.17-25.40 ozs.), but almost 89 percent of the pack was put up in can sizes varying between 125 to 180 grams (4.41-6.35 ozs.). The most popular can size was 130 grams (4.59 ozs.), which accounted for 29 percent, or 3,695 tons, of the total pack. The next popular can was the 150-gram size (5.29 ozs.) accounting for 28 percent or 3,606 tons, of the total pack. Only about 9 percent, or 1,078 tons, of the 1957 sardine pack was packed in 425- to 454-gram cans (about 1 pound net weight).

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OTTER TRAWL GEAR REGULATIONS REVISED:

The Venezuelan Official Gazette (Gaceta Oficial) No. 25977 of June 3, 1959,

carried the following resolution of the Ministry of Agriculture and Husbandry:

"In view of studies realized by the Ministry of Agriculture and Husbandry, it has been observed that fishing by the otter trawl system has been practiced with nets whose mesh does not meet the required size and, contrary to the normal purpose of such nets, there are materials attached to the nets which reduce the selectivity of the net to its smallest form with resulting harm to the marine animal life and the medium in which it lives and, in consequence, goes against norms established for the conservation of live marine resources; this office in accordance with authority invested in it by Articles 1, 2, and 3 and paragraphs c and e of Article 20 of the Fishing Law, by order of the President of the Republic, submits fishing by the system mentioned to the following conditions:

"Article 1 - The mesh of the different bodies or parts of the net should be of the following sizes:

"a. The first part or terminal body of the net, commonly known as top or crown, should be of a mesh of a minimum size of 6 centimeters (2.36 inches), that is, 3 centimeters (1.18 inches) between knots.

"b. The central part or middle body comprising the part between the crown and the cords, boltrope or tassels or the mouth of the net must consist in the top portion of a minimum mesh of 8 centimeters (3.15 inches), that is, 4 centimeters (1.57 inches) between knots in the posterior half and of 10 centimeters (3.94 inches) in the anterior half. For the inferior part of this section or low roof or belly, these sizes are not applicable and will be determined by the judgment of the owner.

"c. The third body or lateral bands at the end called legs, wings, or sleeves, should consist of a minimum mesh of 12 centimeters (4.72 inches), that is 6 centimeters (2.36 inches) between knots.

"Article 2 - It is also prohibited to connect to the net, in any of its parts, any form of material which would have

Venezuela (Contd.):

the end of reducing directly or indirectly the sizes of mesh specified in all paragraphs of Article 1 of this resolution, such as those called "shirts," protective sacks, and similar items.

"Excepted from the provisions of this article is the use of the so-called 'fine-mesh fishing net' which consists of fragment tied to the tassel or low boltrope for the purpose of protection between the cloth of the net and the low roof.

"Article 3 - It is equally forbidden to wrap or tie pieces of chain or other materials not forming part of the structure of the net itself to the low boltrope.

"Article 4 - Likewise, it is prohibited to throw these nets over banks of mother-of-pearl or other mollusks of economic importance.

"Article 5 - It remains the judgment of the Ministry of Agriculture and Husbandry to demarcate the areas in which such practices will be applied but in no case will it be done in the Gulfs of Cariaco, Coro, and Santa Fe or in the lagoons or marshes connecting with the sea.

"Article 6 - Violators of the present resolution will be sanctioned in accordance with the law.

"Article 7 - Thirty (30) days are granted, after publication of this resolution, so that those affected can make the necessary changes in their nets." (United States Embassy in Caracas, June 26, 1959.)

Viet-Nam

NEW SHRIMP FREEZING PLANT TO EXPORT TO THE UNITED STATES:

A Viet-Namese shrimp fishing company has its new shrimp-freezing plant about completed and production was due to start in July. The plant is located on a waterway (Arroyo Chinois) in the center of the Saigon area. Shrimp caught

off the southern coast of Viet-Nam will be cleaned, quick-frozen, and packaged in wax cartons for shipment to San Francis-co. Processing should take only one hour. Arrangements have been made to use a Danish refrigerator ship. Initial production is scheduled to be 600,000 pounds a month.

The shrimp plant operators are expecting a price of about 70 U.S. cents a pound at San Francisco, indicating a gross revenue of US\$420,000 a month foreign exchange, less ocean freight.

The freezing plant benefited by at least US\$50,000 worth of foreign exchange under the Commercial Import Program. shrimp are plentiful, it is believed that this venture has real potential as a most useful foreign exchange earner.

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LANDINGS AND FOREIGN TRADE IN FISHERY PRODUCTS, 1958:

Landings and Outlook: Although no official statistics on the landings of fish and shellfish are available, foreign fishery experts stationed in Viet-Nam estimate the 1958 landings to be close to 110,000 metric tons of marine fish and shellfish and 30,000 tons of fresh-water fish and shellfish. These totals do not include subsistence fishing or fish and shellfish consumed locally, but include only the landings that enter the larger markets. It is estimated that the subsistence fishery catch equals the commercial catch.

It is probable that the commercial catch in 1959 will be larger than in 1958, and that in 1960 it will be much larger. At present the fisheries off the coast of Viet-Nam are relatively unexploited. But now, owing largely to American technical and financial assistance, difficulties of transportation and preservation are being overcome. New fish landing stages (6-8) have been built or are nearing completion, and a satisfactory method of motorizing small bamboo fishing boats has been devised. Production from fresh-water or brackish fish-rearing ponds is steadily increasing. Due to improvement of highways, fresh sea fish are being sold in

Viet-Nam (Contd.):

localities in the highlands which in the past had to depend on salted or canned fish.

Imports: Fish and shellfish imported into Viet-Nam in 1958 amounted to about 5.4 million pounds, valued at US\$430,000 (at official rate of exchange VN\$35 to US\$1). Imports were practically all from Cambodia (4.3 million pounds, valued at US\$252,500) and Japan (1.1 million pounds, valued at US\$167,500). The principal items imported were--1.6 million pounds of fresh pond or river fish and 2.7 million pounds of salted, dried, or smoked fresh-water fish from Cambodia; and about 1.1 million pounds of mollusks from Japan. Imports from countries other than Cambodia and Japan totaled only about 37,000 pounds.

Exports: Exports of fish and shellfish in 1958 totaled 900,000 pounds, with 901,000 pounds exported to Singapore. Only 2,600 pounds were exported to the United States in 1958. Prospects for future exports of fishery products are improving. Exports to Singapore in 1958 were about double those for 1957. With the establishment of a shrimp-processing plant at Saigon, it is likely that exports of shrimp to the United States will become important. As an incentive to exporters, a subsidy of 37 percent by value by making the effective rate of exchange to exporters VN\$48 to the US\$1.

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CANNED SARDINE MARKET:

Due to the dollar shortage and surplus of French francs in Viet-Nam, it is unlikely that the modest share of the market for United States sardines held in 1956 can be regained. Viet-Nam is largely self-sufficient in fishery products with an estimated catch of 100,000 metric tons yearly. Fishery products imports are only of marginal importance and it is believed that further exchange restrictions could be imposed by the Government without repercussions.

According to Viet-Nam customs statistics, imports of canned and prepared fish and shellfish of all types amounted to 493 metric tons in 1958, valued at US\$228,428. Local business sources were unable to give the exact percentage of sardines in this total, but it is believed to be over 50 percent. Most imports originate in Morocco and France due, in part, to a multiple exchange rate which has favored imports from the Franc Zone.

At the end of January 1959, visible stocks of imported sardines were estimated at 138 tons, of which 76 tons were on hand, 56 tons in transit, and 6 tons on order. At current consumption levels, this stock was considered sufficient for 6 to 7 months.

The president of the Association of Foodstuff Importers (affiliated with the Chamber of Commerce) estimates annual

consumption of imported canned sardines at 260 metric tons per year.

The c. & f. price of Moroccan sardines has been 4,000-5,000 French francs per case of 100 cans of 175 grams (6,2-ozs.) net. Converted at the official rate of FFr 493.7 to US\$1.00, the landed price has been roughly US\$8.00 to \$10,00 per case. If freight rates of US\$1.30 to \$1.51 per case (conference rates for equivalent cases) are added to the current prices for California sardines, it is likely that California sardines would be competitive on the Viet-Nam market.

The difficulties encountered by United States sardine canners in exporting sardines to Viet-Nam have arisen from the exchange rate in effect for sardines. Canned goods and fish products are not eligible for financing within the framework of the local currency-generating International Cooperation Administration Commercial Import Program, in which the official rate of VN\$35 to US\$1.00 is applicable. The Government has refused to make its own holdings of exchange available at the official rate and has shown no signs of will ingness to do so in the foreseeable future. Exchange has been made available only on payment of a surtax of 60 piasters which, when added to the official rate, resulted in an effective rate of 95 piasters to US\$1. On the other hand, the Government was willing to sell nonconvertible French francs with a much lower surtax, making the effective rate only about 65 plasters for one dollar's worth of francs. This policy, which has affected all commodities imported under the highcost exchange regime, was not prompted by a desire to benefit Franc Zone suppliers over suppliers in the dollar and sterling areas, but rather by the Government's desire to draw down the country's large holdings of nonconvertible francs which have twice been affected by devaluation in the last two years. The end result has been that Moroccan or French sardines which might have sold at the same dollar price have been landed at a piaster cost of at least 30 percent below California or Japanese sardines.

	Quantity			Value		
Country of Origin	1958	1957	1956	1958	1957	1956
	. (Metric Tons) .		(US\$1,000)			
Fish (preparations conserves): Morocco Japan United States Cambodia Hong Kong France Sweden Algeria Denmark	364 32 - 14 - 41 -	230 4 - 32 - 18 - 19	165 159 43 25 20 11 2	190 11 - 1 - 26 -	136 1 2 21 - 11	85 61 18 3 8 9 2
Total	451	303	426	228	171	187
Shellfish (prepara- tions & conserves)	42	33	57	39	38	63
Other Fishery Products (fresh, salted, dried, smoked, or cooked)		1,864	1,689	430	271	401

A decision has recently been taken by the Government to eliminate the broken cross-rate in the high-cost exchange regime. Effective May 15, 1959, the surtax on dollar imports was reduced to 50, making an effective rate of 85 piasters to US\$1, and the surtax on francs was increased to make a comparable effective rate for franc imports. While it might logically follow that United States exports would benefit from the new rate, there is no assurance that this will be the case. The Government will probably refuse, as it has often refused in the past, to allocate dollars for imports which can be procured with francs. While formerly it was to the importer's advantage to buy canned sardines in the Franc Zone, now he will probably be forced to whether or not it is to his advantage.

There is one factory producing canned sardines at Phan Thiet, one of the principal fishing ports in Viet-Nam. AcViet-Nam (Contd.):

cording to the owner, annual production ranges from 5,000 to 10,000 cases, all of which is consumed locally. This firm has tentative plans to expand its operations to produce 50,000 cases per year, of which 30,000 would be exported. However, the owner stated that the firm has had difficulty

competing with imports and would need tax concessions on imported raw materials and more protection than has heretofore been afforded by the multiple exchange rate. Whether the recent measure will affect the firm's expansion plans is not known. The Government has shown no signs of encouraging the company, perhaps because it is controlled by Chinese interests, according to a May 18, 1959, dispatch from the United States Embassy in Saigon.



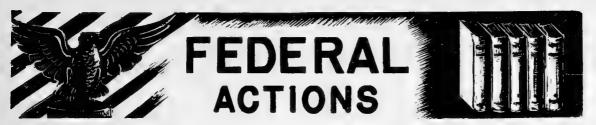
STORAGE EXPERIMENT EXHIBIT AT -20° F., 0° F., +10° F.

At the National Fisheries Institute Convention in April 1959, the NFI Technology Committee experimental exhibit was arranged to permit industry members to determine the effects of storage temperature, packaging methods, and short periods of mishandling on the acceptability of several fishery products. The basic experimental study simply involved storage of packages of seven different products at -20° F., 0° F., and +10° F. for 9 to 10 months.

The products were prepared and packaged during June and July 1958 in accordance with usual commercial practices in fishery plants located in Gloucester, Boston, Bayou La Batre, Astoria, and Vancouver (B.C.). All were prime or at least very good quality raw materials and all were packaged in standard commercial materials. Ocean perch, haddock, halibut, silver salmon, and raw Gulf shrimp were all packed in standard waxed paperboard cartons and overwrapped with waxed bleached sulfite paper. Cooked dungeness crabmeat and cooked Pacific shrimp meat were packed in vacuum sealed cans. The products were frozen on plate freezers or in freezer rooms at -40° F. Each of the products were divided into three lots and stored from June or July 1958 until early April 1959 at the three temperatures of -20° F., 0° F., and +10° F. They were stored in well-watched facilities in Vancouver, B. C., Pascagoula, Miss., and Boston, Mass. They were shipped under proper refrigeration to New York, where they were held at -10° F. to -20° F. for the few days prior to their being opened, thawed, and examined April 11 to 14 at the Convention.

Those who viewed the exhibit samples concluded that:

- 1. A good quality fishery product, packaged in standard waxed paperboard cartons, with waxed overwraps, will remain a highly acceptable product for nine months or longer when stored continuously at -20° F.
- 2. Samples of the same products stored at 0° F. for the same time were still probably acceptable and salable, but showed definite dehydration and losses of color.
- 3. Storage at $\pm 10^{\circ}$ F. for nine months results in very serious dehydration and losses of color. The salmon, ocean perch, and raw shrimp were hardly fit for sale, and other products were of very poor quality. ("Technical Tips" No. 8, N. F. I. Flashes.)



Department of Commerce

COAST AND GEODETIC SURVEY

FIRST EDITION OF SMALL-CRAFT SERIES 101, POTOMAC RIVER:

The first edition of Small-Craft Chart Series 101, Potomac River, has just been published, the U. S. Coast and Geodetic Survey announced on June 5, 1959.

The new series represents what is probably the most significant development in the progress of nautical charting since the adoption of color in 1862.

One of the most interesting aspects of the new format is that the opinions of over 24,000 small-craft owners and operators were solicited for guidance in the design and construction of this entirely new type of chart.

The Coast and Geodetic Survey has long recognized the need for a special chart which will add to the safety and pleasure of the small boat owner.

On the basis of the conclusions reached from a survey of 7,000 members of the U. S. Power Squadrons and Coast Guard Auxiliary, a program was initiated in July 1958 to develop four different formats covering the Potomac River. This area was selected for the pilot series because the configurations of the waterway are similar to the intracoastal waterway and the major rivers.

On the basis of the new surveys, four series were developed each covering the same area and including the same basic chart information but varying in format and supplementary information offered. The series were designated A, B, C, and D and 3,000 copies of each were printed and distributed with accompanying questionnaires.

After analyzing the returns from more than 23,000 questionnaires, Series B, printed on 14-1/2x32 inch paper, folded into four panels, was selected for reproduction and sale to the public. It divides the river into three cruising areas; each sheet carries the insets, photographs, and facility information for the base chart coverage. The basic chart is at a scale of 1:80,000 with the Washington area enlarged to 1:40,000. There are insets of active areas with tabulated facilities keys to their respective locations. The descriptive information is carried on the reverse side of the folds. Oblique photograph views of selected areas are printed in half tone.

Additional changes suggested by boatmen expressing a preference for Series B were incorporated into the final version now designated Small-Craft Chart Series 101. These changes include larger compass roses, both true and magnetic; headings on the course-index line; nautical mile and yard scales on insets; increased line weight of inset limits on the base chart; full color printing of insets and indexes; improved facility indicator numbers placed in boxes with a leader to an exact location; added green tint to define low-water lines; indicated junction lines on sheets based on mileage; north arrow and common reference points on oblique photos; time of tides for Washington, D. C.; red tint to more clearly define danger sectors on navigational aids; and a table of basic whistle signals.

Average maximum velocity and direction of current is shown on the base chart and tidal information is included in the facilities tables. Aids to navigation are increased in size for greater legibility and carefully selected type faces insure easy reading. Except for the special features described, the basic chart conforms to the highly developed conventional nautical chart produced by the Coast and Geodetic Survey. The chart is printed in five colors: buff overprint for land areas; blue tint extended to the six-foot depth curve; red for restricted, danger, and fish trap areas, and for emphasis on such features as aids to navigation, anchorages, pipelines, cable areas, etc. Cultural detail, place names, projections, and scales are printed in black.

Of special interest to boat operators in the District of Columbia area is that the Washington and vicinity area of the chart carries soundings up the Potomac to Chain Bridge, and up the Anascostia to the area now being dredged by the Corps of Engineers. These areas had not previously been charted.

Publication of <u>Small-Craft Series 101</u> completes the initial phase of the small-boat charting project. The chart makes the Potomac River an experimental area to serve as a prototype for new charts of other selected areas. This program will be intensified as funds are made available and should be well advanced at the end of the next decade.

<u>Small-Craft Series 101, Potomac River</u>, is distributed at \$1.50 a copy. Copies are available from sales agents, district offices, and from the Washington Office of the Coast and Geodetic Survey.

New editions of charts cancel former editions. They include all corrections published in <u>Notice To Mariners</u> and all other corrections which were too extensive to be applied to the chart by hand and therefore were not published in the <u>Notice To Mariners</u>. Mariners are warned against the use of obsolete charts as new editions contain information essential to safe navigation.



Department of Labor

WAGE INCREASE RECOMMENDED FOR FISH CANNING AND PROCESSING WORKERS IN AMERICAN SAMOA:

Hearings on minimum hourly wagerate revisions for American Samoa were held at Pago Pago from July 3 to 14,1959. For the fish canning and processing industry, a special industry committee has recommended an increase to 75 cents an hour from the present rate of 52 cents an hour.

The Fair Labor Standards Act authorizes special industry committees to recommend minimum hourly wage rates in the territories for industries now operating at or below the \$1.00 statutory minimum that applies for the continental United States. The committee was appointed by the Secretary of Labor to in-

clude representation of employers, employees, and the public from both the mainland and American Samoa. The committee, following hearings, filed a report of its findings and recommendations with the Administrator of the Wage and Hour and Public Contracts Divisions of the Department of Labor. Committee recommendations usually become effective 15 days after publication in the Federal Register.

The published findings and recommendations of the committee were expected to be available from the Department of Labor late in August.



Department of the Treasury

BUREAU OF CUSTOMS

DECISION RENDERED ON CLASSIFICATION OF IMPORTED FISH BLOCKS:

On July 15, 1959, the United States Customs Court in New York City rendered a decision on the proper classification of imported fish blocks. The decision by the Court ruled that imported fish blocks are classifiable under Tariff Paragraph 720 (b), at 1 cent a pound when the block and its immediate container weigh in excess of 15 pounds. In containers under 15 pounds, the duty rate for fish blocks is $12\frac{1}{2}$ percent ad valorem. The decision bears out the contention of the plaintiffs in the case, that imported fish blocks are further processed than fish fillets. This decision, which reverses a previous ruling by the U.S. Bureau of Customs, may be appealed within 60 days.

* * * * *

DEFINITION OF AIR-TIGHT CONTAINERS FOR IMPORTED FROZEN FISHERY PRODUCTS CLARIFIED:

In Treasury Decision 54878 (4), the U. S. Bureau of Customs states that a single polyethylene container, not exceeding 0.002 inches in thickness, is not an air-tight container. Polyethylene wrappers of this thickness are commonly used in packaging frozen fishery products imported into the United States.

This decision will help to solve the problem created by two other decisions, which held that cryovac containers and containers made from double thickness film or double-layered film are air-tight and frozen products imported wrapped in those containers are dutiable at $12\frac{1}{2}$ -percent ad valorem.



Eighty-Sixth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the



fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings,

and other actions by the House and Senate as well as signature into law or other final disposition are covered.

COLUMBIA RIVER FISHERIES INVESTIGATION:
The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce July 17 held hearings on S. Con.
Res. 35, to make an investigation concerning anadromous fish in the Columbia River Basin. (See Commercial Fisheries Review, June 1959, pp. 91-92, Power Projects Fisheries Resources Protection.)

The House July 29 disagreed to Senate amendments to H. R. 7509, Public Works Appropriation bill, making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority, for fiscal year 1960; agreed to conference requested July 9 by the Senate, and appointed conferees. Included are funds for the Corps of Army Engineers and Bureau of Reclamation for water resources construction and investigation programs, including certain Columbia River projects.

Public Works Appropriations for 1960 (Hearings before Subcommittee on Public Works Appropriations of the House Committee on Appropriations, in four parts, 86th Congress, 1st Session, making appropriations for the civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority, for fiscal year ending June 30, 1960, and for other purposes), 4,287 pp., printed, including lists of witnesses and indexes. Part 1, Civil Functions, Department of the Army; Part 2, Bonneville Power Administration, Bureau of Reclamation, Southeastern Power Administration, and Tennessee Valley Authority; Part 3 and 4, Statements of Members

of Congress, Interested Organizations, and Individuals. Included are funds for the Corps of Army Engineers and Bureau of Reclamation for water resources development, management, construction, and investigation programs including certain Columbia River Basin projects.

Public Works Appropriations, 1960 (Hearings before Subcommittee of Senate Committee on Appropriations, 86th Congress, 1st Session, on H. R. 7509, making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority, for fiscal year ending June 30, 1960, and for other purposes), 4,061 pp. including lists of witnesses and indexes. Included are funds for the Corps of Army Engineers and Bureau of Reclamation for water resources development, management, construction, and investigation programs, including certain Columbia River Basin projects.

DUMPING RESTRICTIONS IN COASTAL WATERS: H. R. 8584 (Miller), a bill to amend section 4472 of the Revised Statutes to provide that disposition at sea of certain explosives and other dangerous articles shall be subject to regulation; to the Committee on Merchant Marine and Fisheries; introduced in House August 10. Similar to H. R. 8058 and related bills previously introduced designed to protect fishery resources and to safeguard navigation.

FISH HATCHERIES: House Report No. 654, Establishing a Fish Hatchery in the Northwestern Part of the State of Pennsylvania (July 14, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries to accompany H. R. 2398), 3 pp., printed. The report contains the purpose and provisions, legislative history, Committee recommendations, and Department of the Interior report favoring enactment of the bill

The House July 20 passed H. R. 2398, without amendment, and sent the bill to the Senate; referred to the Senate Committee on Interstate and Foreign Commerce.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce August 4 held hearings on <u>H. R.</u> 2398 and ordered the bill favorably reported to the full Committee. Senate Committee on Interstate and Foreign Commerce August 5 reported the bill to the Senate recommending enactment (<u>S. Rept.</u> 622).

Senate Report No. 622, Establishing a Fish Hatchery in the Northwestern Part of the State of Pennsylvania (August 6, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce, to accompany H. R. 2398), 3 pp., printed. Contains the purpose and provisions of the bill, legislative history, Committee recommendations, and departmental approval of the legislation.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislative bills including S. 2053, a bill providing for transfer of the

Orangeburg County Fish Hatchery, S. C., to the United States and provide for improvement and expansion of its facilities and for other purposes.

FISH AND WILDLIFE AID THROUGH EQUIP-MENT TRANSFERS: H. R. 8373 (Barry), a bill to provide that surplus property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; to the Committee on Government Operations; introduced in House July 23. Similar to H. R. 7190 and related bills previously introduced which would provide change in existing laws to include State Fish and Game Departments among agencies eligible for receipt by transfer of surplus Federal Government property and equipment for use in furthering their fish and wildlife conservation, restoration, and educational objectives.

Special Subcommittee of the Senate Committee on Government Operations held hearings July 29 and 30 on pending bills providing for the expansion of the donable property program, authorized under the Federal Property and Administrative Service Act of 1949, to other public agencies and organizations. Includes bills providing for fish and wildlife aid through transfer of surplus property and equipment for use in furthering fish and wildlife conservation, restoration, and educational objectives.

Also S. 2442 (Gruening and Bartlett), a bill to provide for the disposition of surplus personal property to the government of Alaska; to the Committee on Interior and Insular Affairs; introduced in Senate July 24; and H. R. 8408 (Rivers of Alaska), an identical bill; to the Committee on Government Operations; introduced in House July 27. Would extend an Act which provided for the disposition of surplus personal property to the Territorial Government of Alaska (68 Stat. 794), as amended (70 Stat. 918), which among other purposes, included certain surplus Federal Government property and equipment for use in furthering fish and wildlife conservation, restoration, and educational objectives; and would further provide for elimination of inappropriate references occasioned by recent Statehood. Somewhat similar to H. R.7190 and related bills previously introduced which among other purposes would make certain State Agencies eligible for receipt by transfer of surplus equipment to aid fish and wildlife programs.

FISH AND WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries August 4 held hearings but took no action on H. R. 5814, a bill to provide for cooperative unit programs of research, education, and demonstration between the Federal Government of the United States, colleges and universities, the several States and Territories, and private organizations, and for other purposes.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislative bills including S. 1781, companion bill to H. R. 5814.

FISHING VESSEL CONSTRUCTION SUBSIDIES: The House Committee on Merchant Marine and Fisheries July 30 ordered favorably reported H. R. 5421, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes; with amendment (H. Rept. No. 770).

House Report No. 770, Providing a Program of Assistance for the Construction of Fishing Vessels (August 5, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries to accompany H. R. 5421, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes), 10 pp., printed. Contains the bill as amended, committee recommendations, legislative background, purpose and major provisions, summary of need for legislation, and Departmental recommendations. As amended the bill would provide for a subsidy for the construction of new fishing vessels in shipyards of the United States over a 3-year period, and would authorize annual appropriations of one million dollars to carry out the provisions of the program. A provision to establish a loan fund to be used in making loans to processors of fishery products within distressed segments of the fishing industry was eliminated by an amendment to the original bill. H. R. 5421 was previously reported in this periodical under title of Fisheries Assistance Act of 1959.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce held hearings August 5 on S. 1374, and related bill S. 2338, to assist the fishing industry of the United States to regain a favorable economic status. Both legislative bills provide a program of assistance in the construction of fishing vessels, and for other purposes.

FISHING VESSEL MORTGAGE INSURANCE FUND: The Assistant Secretary of the Interior transmitted to the House and Senate a draft of proposed legislation to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes (with accompanying paper); in the House referred July 28 to the Committee on Merchant Marine and Fisheries; in the Senate referred July 29 to the Committee on Interstate and Foreign Commerce.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislation including S. 2342, a bill creating a Federal Fishing Vessel Mortgage Insurance Fund.

S. 2481 (Magnuson), a bill to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate August 4. Would create a Federal Fishing Vessel Mortgage Insurance Fund which shall be used by the Secretary of the Interior as a revolving fund for the purpose of carrying out the ship mortgage

provisions of title XI of the Merchant Marine Act of 1936, as amended, as it applies to fishing vessels under the Fish and Wildlife Act of 1956 (70 Stat. 1120). Further provides that if at any time funds are not sufficient to pay any amount the Secretary of the Interior is required to pay on ship mortgage insurance on fishing vessels, notes or other obligations may be issued to the Secretary of the Treasury as may be necessary. Similar to S. 2342 previously introduced.

Also H. R. 8613 (Bonner); introduced in House August 11; referred to the Committee on Merchant Marine and Fisheries. Identical to S. 2481.

FISHERY PRODUCTS INCLUDED IN FOOD-ALLOTMENT PROGRAM: The House Committee on Agriculture held hearings July 30 and 31 on H. R. 1359, and related bills, to distribute certain surplus food commodities to needy persons in the United States through a food stamp system. Includes legislative bills which would provide for inclusion of fishery products in the program.

GAME FISH IN DAM RESERVOIRS RESEARCH: Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislative bills including S. 1262, a bill to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game fish in dam reservoirs.

IMPORTED COMMODITY LABELING: The House Committee on Ways and Means August 3 ordered favorably reported to the House without amendment, H. R. 5054, to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers. Provides that imported articles removed from original container, repacked, and offered for sale in new package or container, shall be marked to show the ultimate purchaser the English name of the country of origin of such article.

INTERSTATE TRANSPORTATION OF FISH:
House Report No. 653, Clarifying a Provision in
the Black Bass Act Relating to the Interstate Transportation of Fish (July 14, 1959, 86th Congress, 1st
Session, Report of the House Committee on Merchant Marine and Fisheries to accompany H. R.
5854), 3 pp., printed. The report contains the purpose of the bill, Committee Recommendations, executive communications from the Department of
Interior and the Department of Justice, and changes
in existing law. The legislation would provide for
amendment to the Black Bass Act to make clear
that only lawfully taken fish or fish eggs can be
shipped in interstate commerce.

The House on July 20 passed without amendment and sent to the Senate H. R. 5854, to clarify the Black Bass Act relative to interstate transportation of fish.

Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislation including S. 1391, companion bill to H. R. 5854.

INSECTICIDES EFFECT UPON FISH AND WILD-LIFE: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries August 4 held hearings but took no action on H. R. 5813, a bill to amend the act of August 1, 1958, to authorize and direct the Secretary of the Interior to undertake continuing studies of the effects of insecticides, herbicides, fungicides, and other pesticides, upon fish and wild-life for the purpose of preventing losses of those invaluable natural resources and for other purposes.

Senate Subcommittee on Merchant Marine and Fisheries of the Committee on Interstate and Foreign Commerce conducted hearings August 4, 5, and 6 on pending fisheries legislative bills including S. 1575, companion bill to H. R. 5813.

MARINE GAME FISH RESEARCH: Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries August 4 held hearings but took no action on H. R. 5004, a bill authorizing and directing the Secretary of the Interior to undertake continuing research on the biology, fluctuations, status, and statistics of the migratory marine species of game fish of the United States and contiguous waters.

MARKETING FACILITIES IMPROVEMENT ACT: H. R. 8262 (Cooley), a bill to encourage the improvement and development of marketing facilities for handling perishable agricultural commodities; to the Committee on Agriculture; introduced in House July 16. Similar to H. R. 1807 and related bills previously introduced which would provide assistance for improvement and development of public marketing facilities for the wholesale handling of certain perishable commodities, including seafood, as will be conducive to orderly and efficient distribution, increased consumption, a reduction in the spread between prices paid by consumers and those received by producers, and for other purposes.

NORTH PACIFIC FISHERY RESOURCES PROTECTION: S. Res. 145 (Magnuson), a resolution favoring negotiations with the Governments of Canada, Japan, and Russia concerning a new fisheries treaty; to the Committee on Foreign Relations; introduced in Senate July 15.

Whereas in 1952, the Governments of the United States of America, Canada, and Japan, entered into an International Convention for the High Seas Fisheries of the North Pacific Ocean in order to ensure the maximum sustained productivity of the fishery resources of the North Pacific Ocean; and

Whereas said parties to the treaty agreed to establish the meridian of 175° West Longitude, as a Provisional Line, subject to readjustment after scientific study, as a line that best divides salmon of Asiatic origin and salmon of North American origin; and

Whereas while the Japanese have fully complied with that provision of the treaty and have abstained from fishing for salmon east of the Provisional Line of 175° West Longitude, nevertheless there now is a strong body of evidence that the Japanese

INSECTICIDES EFFECT UPON FISH AND WILD-FE: The Subcommittee on Fisheries and Wildlife nservation of the House Committee on Merchant rine and Fisheries August 4 held hearings but have been taking on the high seas red salmon that originated in North American streams and that therefore the Provisional Abstention Line should be changed, as provided for in the treaty; and

Whereas by reason of the heavy catches of red salmon, of American origin, by the Japanese, on the high seas, the return of salmon to American streams has greatly diminished; and

Whereas the Bristol Bay fishery in Alaska, the world's richest red salmon fishery, which gives employment to a substantial segment of the population of the State of Alaska, is headed for extinction by reason of these high seas net fishing operations conducted by the Japanese, and

Whereas the Senate is not unmindful of the fact that the fishing industry is of paramount importance to Japan and that by reason of certain conditions imposed by Russia the Japanese have been restricted in their fishing operations in certain Pacific Ocean areas and by reason of economic necessity have been compelled to fish close to the 175th Parallel; and

Whereas the United States, Canada, Japan, and Russia have a common interest in preserving optimum productivity of the fishery resources of the Pacific Ocean: Now, therefore, be it

Resolved. That it is the sense of the Senate that the Secretary of State should immediately enter into negotiations with the Governments of Canada, Japan, and Russia, looking to the establishment of a new fisheries treaty with these countries and an equitable solution of the problems involved; and be it further

Resolved. That the officials of our Government should promptly negotiate with the Governments of Canada and Japan in an effort to bring about the establishment of a temporary zone in which all parties would voluntarily refrain from fishing until the question of a new Abstention Line can be resolved.

OCEANOGRAPHY: The Senate July 15 adopted with amendments S. Res. 136, relating to research on oceanography and the report of the Committee on Oceanography to the President.

OUTDOOR RECREATION RESOURCES REVIEW COMMISSION: The National Outdoor Recreation Resources Review Commission held its first meeting in conjunction with the newly-appointed 25-person Advisory Council, July 16-17, in room P-61, Senate wing of the Capitol, Washington, D. C.

POWER PROJECTS FISHERIES RESOURCES PROTECTION: H. R. 8495 (Dingell), a bill to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act; to the Committee on Interstate and Foreign Commerce; introduced in House August 3. Similar to S. 1420, previously introduced, which would provide the U. S. Fish and Wildlife Service with collateral jurisdiction in Federal Power Commission decisions affecting hydroelectric power development in areas where dams would impair migratory fisheries resources and wildlife values.

PRICE DISCRIMINATION ENFORCEMENT OF ORDERS: House agreed July 13 to the Senate amendments to House amendments to S. 726, to provide for the more expeditious enforcement of cease-and-desist orders issued under the Clayton Act, which action cleared the bill for Presidential consideration. The legislation would implement the enforcement procedures of the Clayton Act by making applicable the present Federal Trade Commission Act enforcement provisions against price discrimination, tying arrangements, mergers, and interlocking directorates, and for other purposes.

The President July 23 signed into law <u>S. 726</u>, to amend section II of the Clayton Act so as to provide for the more expeditious enforcement of cease-and-desist orders issued thereunder (<u>P. L. 86-107</u>).

PRICE DISCRIMINATION FUNCTIONAL DIS-COUNTS: Functional Discounts (Hearings before Antitrust Subcommittee No. 5, of the House Committee on the Judiciary, June 25 and 26, 1959, 86th Congress, 1st Session, on H. R. 848, H. R. 927, H. R. 2788, H. R. 2868, and H. R. 4530, bills to amend section 2(a) of the Clayton Act, as amended by the Robinson-Patman Act, by adding a new proviso), 169 pp., printed, including table of contents. Report contains text of legislative bills; testimony and correspondence presented by Committee members, interested individuals, and representatives of industry and the Congress in support of and in opposition to proposed legislation. The legislation would impose a duty on the manufacturer to insure that the small retailer remains competitive by establishing appropriate differentials for the wholesaler or jobber from whom this retailer must purchase. The bills would add a new proviso to the Clayton Act, as amended by the Robinson-Patman Act, designed to make it necessary for the manufacturing seller to grant in good faith a "reasonably adequate" price differential to wholesalers. It further requires that such a differential be "reasonably calculated" to allow the wholesaler's customers to compete with like firms which purchase directly from the seller. These functional discount requirements would not, however, be imposed upon the seller willing to accommodate all would-be purchasers without regard to their size or status in the distributive process.

PUERTO RICO STATEHOOD: S. 2396 (Chavez), a bill to require the Commonwealth of Puerto Rico to conduct a referendum to determine whether the people of such Commonwealth desire to be admitted into the Union as a State; to the Committee on Interior and Insular Affairs; introduced in Senate July 16. Similar to H. R. 7003 previously introduced.

RADIOACTIVE MATERIAL DISPOSAL RESTRICTIONS: H. R. 8187 (Thompson of Texas), a bill to impose certain restrictions on disposing of radioactive materials by depositing it in the Gulf of Mexico, and for other purposes; to the Joint Committee on Atomic Energy; introduced in House July 13.

Also H. R. 8423 (Bennett of Florida), a bill to impose certain restrictions on disposing of radioactive material by depositing it in the Atlantic Ocean, and for other purposes; to the Joint Committee on Atomic Energy; introduced in House

July 28. Similar to H. R. 8187 previously introduced but which provided restrictions for disposal of radioactive waste only for the Gulf of Mexico.

The Special Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries July 13 and 14 conducted hearings on the disposal of radioactive material and atomic waste. Testimony was presented by representatives of the Atomic Energy Commission and the U. S. Bureau of Commercial Fisheries.

The Special Subcommittee on Radiation of the Joint Committee on Atomic Energy July 22 met in executive session to consider a draft of its report on waste disposal, on which subject hearings were recently held. The Subcommittee held an additional day of hearings with regard to this matter on July 29.

Industrial Radioactive Waste Disposal (Hearings January 28, 29, and 30, February 2 and 3, 1959, Volume I, before Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, Congress of the United States, 86th Congress, 1st Session, on industrial radioactive waste disposal), 986 pp., printed. Volume 1, of four volumes, covers hearings concerned with the origin and nature of various types of radioactive wastes evolved from nuclear energy activities and operations in use to manage these wastes at various Atomic Energy and other installations. Also the volume deals with the international aspects of the disposal problems.

SALT-WATER RESEARCH LABORATORY: Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce held hearings August 4, 5, and 6 on pending fisheries legislative bills including S. 1576, a bill to provide for the construction of a saltwater research laboratory at Seattle, Wash. The bill would provide for construction and equipping of a laboratory for the purpose of conducting research on marine life. Such laboratory would be operated jointly by the State of Washington Department of Fisheries, the University of Washington's College of Fisheries and School of Oceanography, and the U. S. Fish and Wildlife Service.

SHIP MORTGAGE INSURANCE AMENDMENTS OF 1959: The House on July 20 passed and cleared for the President S. 1434, to amend the Merchant Marine Act with respect to insurance of ship mortgages. The legislation provides that the prospective owner be permitted to delay placing a mortgage on a vessel until some time after it has been delivered by the shipbuilder, without losing privilege of having the mortgage insured.

The President July 31 signed into law S. 1434, to amend the Merchant Marine Act with respect to insurance of ship mortgages (P. L. 86-123).

SHRIMP IMPORT DUTIES: H. R. 8184 (Preston), a bill to provide for an ad valorem duty on fresh, frozen, or breaded shrimp imported during the next 2 years; to the Committee on Ways and Means; introduced in House July 13. Provides for amendment of the Tariff Act of 1930 by shifting fresh, frozen, and breaded shrimp from the "free" list to the "duty" list of import commodities and to impose a 33½ percent advalorem duty on such

shrimp classifications. Canned and other processed shrimp would not be affected. Somewhat similar to H. R. 483 previously introduced but which provided for an ad valorem duty of 35 percent on all classifications of shrimp, without exception.

Also H. R. 8566 (Sikes), a bill to provide an ad valorem duty on the importation of shrimp; to the Committee on Ways and Means; introduced in House August 6. The proposed legislation would provide for a duty of 35 percent ad valorem on all classifications of imported shrimp. Identical to H. R. 483 and somewhat similar to related bill H. R. 8184 previously introduced which would provide for duties on shrimp importations to protect the domestic industry and for other purposes.

SMALL BUSINESS LEGISLATIVE HEARINGS: The Subcommittee on Small Business of the Senate Committee on Banking and Currency July 22 concluded scheduled hearings on bills to amend the Small Business Act and the Small Business Investment Act of 1958. The current series of hearings was held June 22, 29, and 30; July 1, 2, 8, 20, 21, and 22.

SMALL BUSINESS AND FOREIGN TRADE: Subcommittee No. 3 of the House Select Committee on Small Business July 14 and 15 conducted hearings with respect to the effect of international trade on small business.

SMALL BUSINESS TAX RELIEF: H. R. 8604 (Steed), a bill to provide a program of tax adjustment for small business and for persons engaged in small business; to the Committee on Ways and Means; introduced in House August 10. Similar to H. R. 2 and related bills which provide for tax adjustment in the interest of small business.

STATE DEPARTMENT APPROPRIATIONS: The President on July 14 signed into law H: R. 7343, fiscal 1960 appropriations for the Departments of State and Justice, the Judiciary, and related agencies (P. L. 86-84). Included under the Department of State are funds for the International Fisheries Commissions to enable the United States to meet its obligations in connection with participation in eight such commissions pursuant to treaties or conventions, and implementing Acts of Congress. Provides \$1,725,000 for the International Fisheries Commissions, an increase of \$61,300 over the 1959 fiscal year appropriation to meet increased pay costs, but \$29,000 below the amount requested in the budget estimate.

SUPPLEMENTAL APPROPRIATIONS, 1960: Senate Committee on Appropriations conducted hearings on H. R. 7978, supplemental appropriations for fiscal year 1960, July 13, 14, 16, 17, 20, 21, 22, 23, and 24. Committee met in executive session July 29 and 30 and ordered the bill favorably reported to the Senate, with amendments (S. Rept. 597). Included are funds for transitional grants to Alaska, pursuant to legislative authorization (Public Law 86-70); for the National Outdoor Recreation Resources Review Commission; and for certain River Basin Study Commissions.

Senate August 3 passed with committee amendments \underline{H} . \underline{R} . $\underline{7978}$, supplemental appropriations for fiscal year $\underline{1960}$. Senate insisted on its amend-

ments, asked for conference with House, and appointed conferees.

Senate Report No. 597, Supplemental Appropriations Bill, 1960 (July 31, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Appropriations to accompany H. R. 7978, a bill making supplemental appropriations for the fiscal year ending June 30, 1960, and for other purposes), 36 pp., printed. Contains budget estimates, House allowances, and Committee recommendations. Included are tables showing comparative statement of budget estimates and amounts recommended for Department or activity.

Supplemental Appropriation Bill for 1960 (Hearings before the Senate Committee on Appropriations, 86th Congress, 1st Session, on H. R. 7978, an act making supplemental appropriations for the fiscal year ending June 30, 1960, and for other purposes), 946 pp., printed, including list of witnesses and index. Contains budget estimates, House allowances, testimony presented by agencies and Departments of Government, and certain legislative authorizations. Included are funds for transitional grants to Alaska; for the National Outdoor Recreation Resources Review Commission; and for certain River Basin Study Commissions.

TRADE AGREEMENTS PROGRAM: The Chairman of the U.S. Tariff Commission, pursuant to law, transmitted to the House and Senate the 11th Annual Report of the Commission on the operation of the trade agreements program, for the period July 1957-June 1958 (with accompanying papers); in the House referred July 21 to the Committee on Ways and Means in the Senate referred July 23 to the Committee on Finance.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: H. R. 8524 (Fulton), a bill to establish an effective program to alleviate conditions of substantial and persistent unemployment and underemployment in certain economically depressed areas; to the Committee on Banking and Currency; introduced in House August 4. Similar to H. R. 71 and related bills previously introduced which would provide for economic assistance and unemployment relief to depressed areas, and for other purposes.

WAGES: The Subcommittee on Labor of the Senate Committee on Labor and Public Welfare on July 10, in executive session, ordered favorably reported to the full committee with amendments S. 1046, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the Act to \$1.25 an hour, and for other purposes.

To Amend The Fair Labor Standards Act (Hearings May 7, 8, 11, 12, 13, 14, 15, 19, 26, and June 4, 1959, Subcommittee on Labor of the Senate Committee on Labor and Public Welfare, 86th Congress, 1st Session, on S. 25, S. 141, S. 1046, S. 1116, S. 1470, S. 1874, and S. 1967, bills to amend the Fair Labor Standards Act of 1938 to extend coverage under the Act, to increase the minimum hourly wage rate, and for other purposes), 1,283 pp., printed. Contains text of the several legislative bills;

testimony presented by Government and industry representatives; certain Departmental, Commission, and Committee reports; various statements, letters, and information submitted.

S. 1046 Amendments, intended to be proposed by Senator Prouty to bill S. 1264 (Kennedy and other Senators), to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the Act to \$1,25 an hour, and for other purposes; to the Committee on Labor and

Public Welfare; introduced in Senate July 17. Provides for several technical amendments to <u>S</u>. <u>1046</u>, previously introduced.

WAGE LAW ENFORCEMENT OF CERTAIN PROVISIONS: S. 2385 (Prouty), a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide more effective procedures for enforcing the provisions of the Act; to the Committee on Labor and Public Works; introduced in Senate July 15. Provides for amendment to existing law to strengthen enforcement provisions in regards to payment of minimum wages and overtime compensation. Similar to H. R. 8059 previously introduced.



SHRIMP

Shrimp--one of the most popular shellfish--are available all year-round. They are found off the Atlantic coast from North Carolina south, in the Gulf of Mexico, and on the Pacific Coast from Southeastern Alaska to San Francisco Bay.

The shrimp sold in most regions of the United States are the "tails." They may be purchased fresh or frozen, raw, cooked, or breaded.

Shrimp are customarily sold according to size or grade. The terms used are jumbo, large, medium, and small. The largest size runs 15 or fewer shrimp to the pound and the smallest size runs 60 or more to the pound.

Although shrimp range in color from greenish gray to brownish red when raw, they differ little in appearance and flavor when cooked. All of the various kinds of shrimp are tender and white-meated, with a distinctive flavor.

Shrimp are used in cocktails, salads, fried, and as the main ingredient for many delicious and satisfying main dishes such as "Shrimp Oriental," a fried shrimp recipe recommended by the Home Economists of the U.S. Bureau of Commercial Fisheries.

SHRIMP ORIENTAL

 $\begin{array}{cccc} 1\frac{1}{2} \text{ pounds shrimp,} & 1 & \text{cup flour} \\ & \text{fresh or frozen} & 3 & \text{eggs, beaten} \\ \frac{1}{4} \text{ cup lemon juice} & 1\frac{1}{2} \text{ teaspoons salt} \end{array}$

Thaw frozen shrimp. Peel shrimp. Cut almost through lengthwise and remove sand veins. Wash. Pour lemon juice over shrimp and let stand 10 minutes. Place flour in paper bag. Add shrimp and shake well. Combine egg and salt. Dip each shrimp in egg. Place shrimp in a heavy frying pan which contains about one-eighth inch fat, hot but not smoking. Fry at moderate heat. When shrimp are brown on one side, turn carefully and brown the other side. Cooking time approximately four minutes. Drain on absorbent paper. Serves 6.

FISHERY INDICATORS

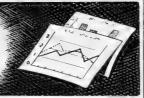
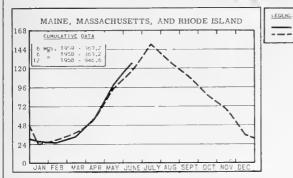
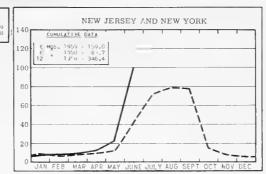
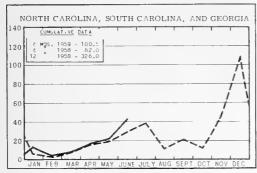


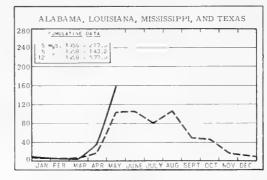
CHART I - FISHERY LANDINGS for SELECTED STATES

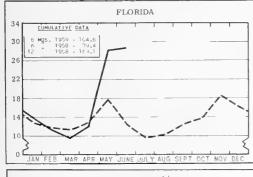
In Millions of Pounds

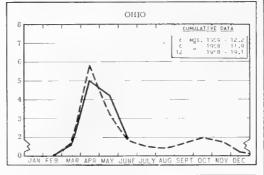


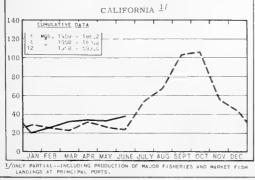












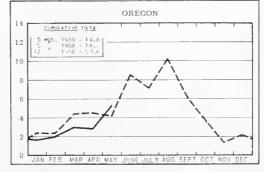
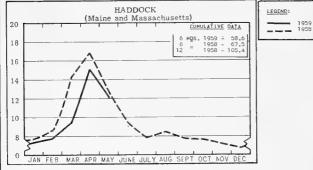
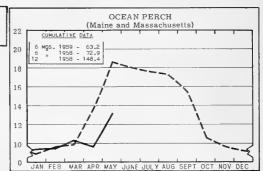


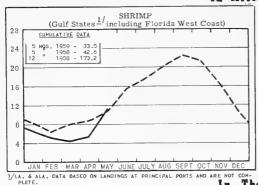
CHART 2 - LANDINGS for SELECTED FISHERIES

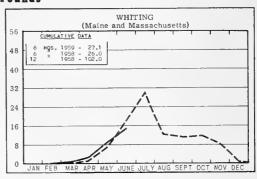
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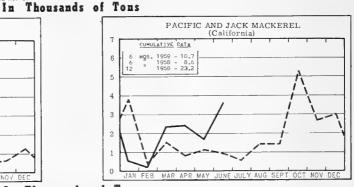


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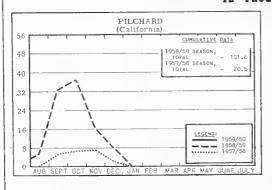




MENHADEN (East and Gulf Coasts) 280 CUMULATIVE DATA 240 200 160 120 80 40 MAR APR MAY LUNE JULY ALG SEPT O



In Thousands of Tons



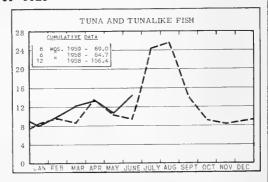
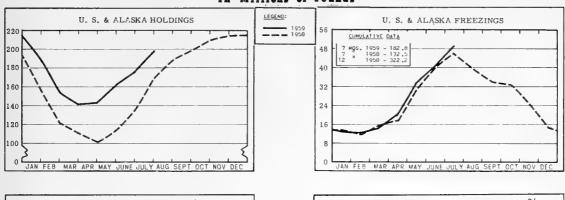
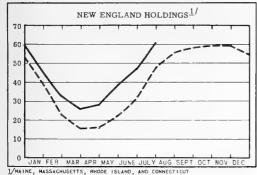


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

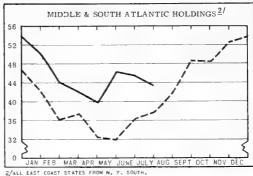
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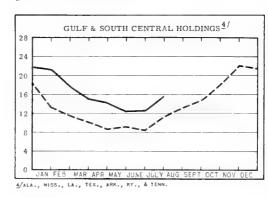


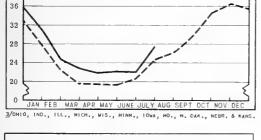




40

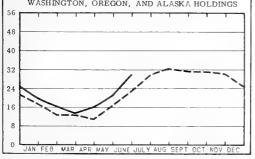


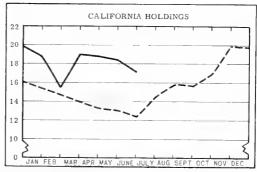




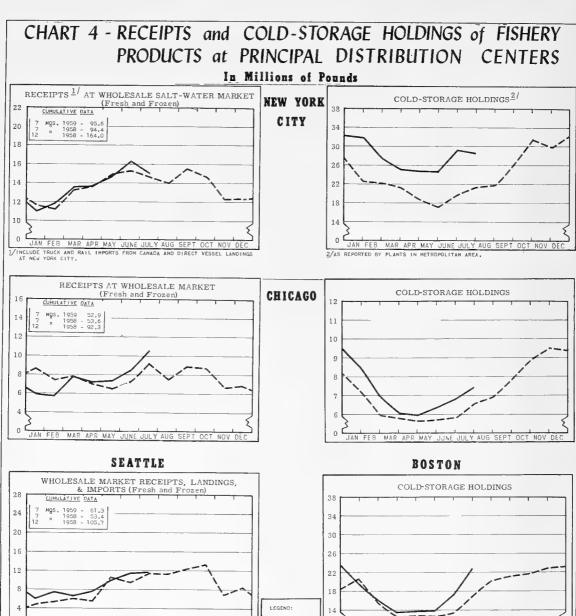
MIDDLE WEST HOLDINGS 3/

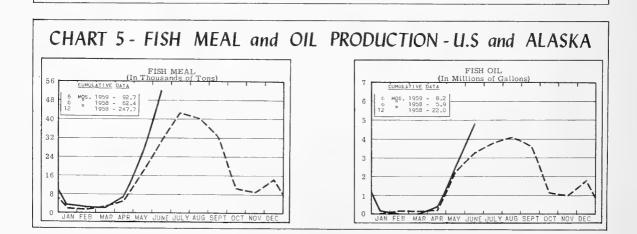
WASHINGTON, OREGON, AND ALASKA HOLDINGS





^{*} Excludes salted, cured, and smoked products





1800

1600 140

1200

1000

80 60

24

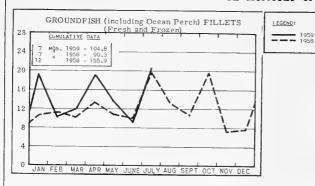
16 12

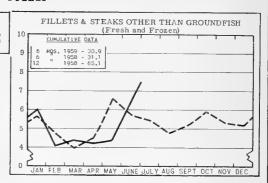
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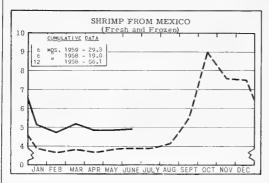
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS In Thousands of Standard Cases MACKEREL 2/ - CALIFORNIA LEGEND: TUNA AND TUNALIKE FISH - CALIFORNIA 1959 CUMULATIVE DATA 100 80 60 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DE 2/ INCLUDES PACIFIC MACHEREL AND JACK MACKEREL. ANCHOVIES - CALIFORNIA SALMON - ALASKA 28 CUMULATIVE DATA CUMULATIVE DATA 2 Mg. 1959 - 1,267.0 2 1958 - 1,594.6 12 MOS. 1958 - 2,944.6 40 SARDINES 1/ (Estimated) - MAINE STANDARD CASES 800 700 No. Cans Designation Net Wgt. SARDINES.... 100 ½ drawn 600 $3\frac{3}{4}$ oz. SHRIMP.... 5 02. 500 TUNA..... 48 # $\frac{1}{2}$ tuna 6&7 oz. 400 PILCHARDS... 48 # 1 oval 15 oz. 300 SALMON..... 48 1-lb. tall 16 oz. 200 ANCHOVES... 48 l-lb. JAN FER MAR APR MAY JUNE JULY AUG SEPT OCT NOV LEGEND: SARDINES - CALIFORNIA SHRIMP - GULF STATES 11400 CUMULATIVE DATA CUMULATIVE DATA 1958/59 SEASON, TOTAL - 2,222.6 1957/58 SEASON, TOTAL - 497.8 1958/59 SEASON, TOTAL 1957/58 SEASON, TOTAL - 585.9 1000 800 600 400 200

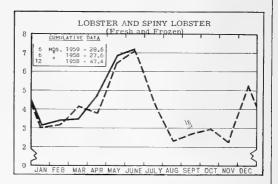
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

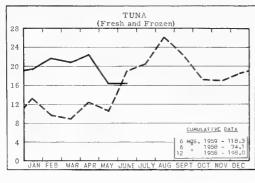
In Millions of Pounds

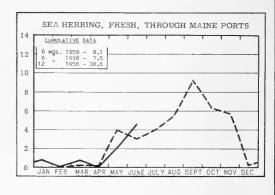


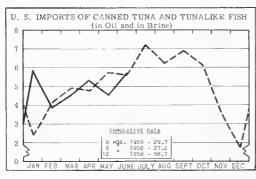


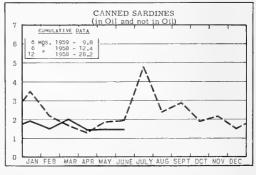


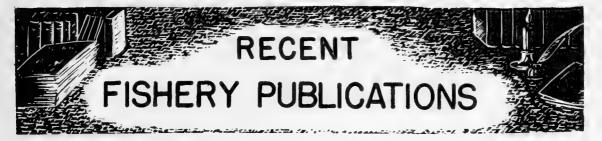












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THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

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- BRANCH OF STATISTICS LISTS OF DEALERS IN AND

PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SER.-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES
(LIMITED DISTRIBUTION).

SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number CFS-1999 - Mississippi Landings, 1958 Annual Summary, 3 pp. CFS-2004 - Alabama Landings, 1958 Annual Sum-

mary, 3 pp.

CFS-2006 - Louisiana Landings, December 1958, 2 pp.

CFS-2027 - New Jersey Landings, March 1959, 3 pp. CFS-2040 - Massachusetts Landings, 1958 Annual

Summary, by ports, 16 pp. CFS-2041 - Massachusetts Landings, 1958 Annual Summary, by gear and subarea, 16 pp.

CFS-2050 - Rhode Island Landings, January 1959, 3 pp.

CFS-2051 - California Landings, January 1959, 4 pp. CFS-2052 - Massachusetts Landings, January 1959,

4 pp. CFS-2053 - New York Landings, March 1959, 4 pp.

CFS-2054 - Alabama Landings, February 1959, 2 pp. CFS-2059 - Shrimp Landings, January 1959, 6 pp.

CFS-2060 - Mississippi Landings, March 1959, 2 pp. CFS-2064 - Fish Meal and Oil, April 1959, 2 pp

CFS-2061 - North Carolina Landings, April 1959, 3 pp.

CFS-2062 - Georgia Landings, April 1959, 2 pp CFS-2063 - South Carolina Landings, April 1959, 2 pp.

CFS-2065 - Massachusetts Landings, February 1959, 5 pp.

CFS-2066 - Florida Landings, April 1959, 7 pp. CFS-2067 - Rhode Island Landings, February 1959, 3 pp.

CFS-2068 - New York Landings, April 1959, 4 pp. CFS-2069 - Frozen Fish Report, May 1959, 8 pp.

CFS-2070 - Maine Landings, April 1959, 3 pp. CFS-2071 - California Landings, February 1959, 4 pp.

CFS-2072 - Texas Landings, March 1959, 3 pp. CFS-2075 - Ohio Landings, April 1959, 2 pp. CFS-2078 - Alabama Landings, March 1959, 2 pp.

CFS-2082 - Texas Landings, April 1959, 3 pp.

Wholesale Dealers in Fishery Products (Revised):

SL- 7 - New Jersey, 1959. SL- 9 - Delaware, 1959.

SL-13 - North Carolina, 1959.

SL-14 - South Carolina, 1959.

SL-15 - Georgia, 1959. SL-17 - Alabama, 1958.

SL-18 - Mississippi Coastal Area, 1959.

SL-22 - Oregon, 1959. SL-23 - Washington, 1959.

SL-33 - Missouri (Mississippi River and Tributaries Area), 1959.

SL-39 - Tennessee, 1959. SL-41 - Arkansas, 1959.

SL-40 - Oklahoma, 1959.

SL-43 - Alabama (Mississippi River and Tributaries Area), 1959.

SL-45 - Mississippi (Mississippi River and Tributaries Area), 1959.

SL-46 - Texas (Mississippi River and Tributaries), 1959.

SL-47 - Louisiana (Mississippi River and Tributaries), 1959.

Firms Canning

SL-102A - Pacific Sardines, 1958.

SL-103 - Tuna and Tunalike Fishes, 1958.

SL-105 - Alewives or Alewife Roe, 1958.

- Shad or Shad Roe, 1958. SL-106

Canned Fish Retail Prices: FL-476h - May 1959, 27 pp.

Canned Fish Consumer Purchases:

FL-478e - April 1959, 31 pp. FL-478f - May 1959, 31 pp.

SSR-Fish. No. 272 - Doctoral Dissertations on the Management and Ecology of Fisheries, Additional Listings, 1952-55, compiled by Harvey L. Moore, 35 pp., January 1959.

SSR-Fish, No. 287 - The Electrical Resistivity Meter in Fishery Investigations, by Robert E. Lennon, 17 pp., illus., January 1959. A portable resistivity (or conductivity) meter is easily used in fishery investigations to obtain rapid and precise measurements of the electrical resistance (or conductance) of waters. These measurements can be used to estimate the total dissolved solids content of waters, to facilitate the selection of appropriate gear for efficient electrofishing, and to determine the velocity, stretch-out, dilution, and effective range of a solute over miles of a stream in conjunction with chemical reclamation operations. Applications of resistivity measurements on Appalachian streams are discussed.

SSR-Fish. No. 295 - Fish and Shellfish Consumption in Public Eating and Drinking Places, vol. II,

213 pp., March 1959. This is the second of two volumes reporting on the results of a survey of fish and shellfish consumption in public eating places. Volume I, issued as Special Scientific Report--Fisheries No. 218, gave an analysis of the responses to the questionnaire on a national basis. Volume II gives an analysis of the cross-tabulated responses on a regional, type-of-establishment, sales-size, and city-size basis.

SSR-Fish-No. 300 - Passage of Salmonoids Through a Darkened Fishway, Clifford W. Long, 12 pp., illus., May 1959.

SSR-Fish. No. 301 - The Problem of Fishway Capacity, by Robert H. Lander, 8 pp., illus, May 1959.

Sep. No. 556 - Construction and Catch Selectivity of Albacore Gill Nets Used in the Central North Pacific.

Sep. No. 557 - Nutritional Values of Fish-Meal Proteins and Their Relation to Processing Variables.

Sep. No. 558 - Research in Service Laboratories (August 1959): Contains these articles--"Canned Tuna Quality Improvement Studies," "Chemical Composition of Pacific Coast Fish and Shellfish," "Control of Drip in Chilled and Frozen Fishery Products," "Freezing and Cold Storage of Pacific Oysters and Fresh-Water Fish," "New Products from Fish Oils," "Studies on Chemical Compounds Formed During Spoilage of Fish."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary,
May 1959, 13 pp. (Market News Service, U. S.
Fish and Wildlife Service, Post Office Bldg., San
Pedro, Calif.) California cannery receipts of
tuna and tunalike fish, mackerel, and anchovies;
pack of canned tuna, mackerel, and anchovies;
market fish receipts at San Pedro, Santa Monica,
and Eureka areas; California imports; canned
fish, imported canned tuna, and frozen shrimp
prices; ex-vessel prices for cannery fish; and
American Tuna Boat Association auction sales;
for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, May 1959, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production, and
Shipments of Fishery Products, May 1959, 6 pp.
(Market News Service, U. S. Fish and Wildlife
Service, 609-611 Federal Bldg., New Orleans 12,
La.) Gulf States shrimp, oyster, finfish, and
blue crab landings; crab meat production; LCL
express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and fishery
imports at Port Isabel and Brownsville, Tex.,
for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for February and March 1959, 19 pp. and 20 pp., respectively (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

Receipts and Prices of Fresh and Frozen Fishery
Products at Chicago, 1958, by G. A. Albano, 63
pp., processed, July 1959. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) In the analysis of receipts of fishery products at Chicago, the author discusses the gain in 1958 fishery products receipts and carload receipts at Chicago. He also discusses sources of receipts, trends in fishery products transportation, receipts by months, receipts by species and varieties, lake trout and whitefish fishery and receipts, cold-storage inventories, imports of fresh and frozen fresh-water fish from Canada, imports of frozen groundfish fillets, and trends and developments in 1958. Also included is a table giving the names, classifications, and approximate weights of certain fishery products as used in the Chicago wholesale markets. The second section presents statistical data on fresh and frozen fishery products receipts at Chicago by species and by states and provinces of origin, states and provinces by species, species by months, states and provinces by months, totals by species, and totals by states and provinces. Receipts are tabulated by method of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled in the Chicago market.

Receipts of Fresh and Frozen Fishery Products at New York City's Fulton Fish Market, 1958 (Includes Statistics and Marketing Trends), by T. J. Risoli, 36 pp., processed. (Available free from the Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York 38, N. Y.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York City's wholesale Fulton Fish Market during 1958, and marketing trends in New York City's wholesale fresh-water fish market for 1958. The second part consists of a series of statistical tables giving the receipts of finfish and shellfish on the salt-water section of Fulton Fish Market, New York City, 1958; receipts by months and methods of transportation; receipts by species, methods of transportation, states and provinces; prices of selected frozen fishery products, 1958, in New York Metropolitan Area; finfish receipts by points of origin and methods of transportation; shellfish receipts by points of origin and methods of transportation; and imports of selected fresh and frozen fishery products, 1958 compared with 1957.

Seattle and Astoria-Landings, Receipts, and Value of Fishery Products, 1958, by Charles M. Reardon, 43 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, Pier 42, South, Seattle 4, Wash.) Reviews Pacific Northwest fisheries trends and their effect upon Seattle fishery products receipts for 1958, halibut landings, carload shipments of fishery products from Seattle by months, truckload shipments from Seattle by months, and

names, classifications, and approximate standards as used on Seattle wholesale market. The Astoria section presents fisheries trends and products receipts for 1958, landings and receipts, and annual totals of landings and receipts for 1957 and 1958. The report also contains a number of statistical tables on fresh and frozen salmon receipts at Seattle, halibut landings, and ex-vessel landings by the otter-trawl fleet

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Fishery Statistics of the United States, 1957, by E. A. Power, Statistical Digest No. 44, 431 pp., illus., printed, \$2, 1959. This is the latest in a series of annual statistical reports on the fisheries of the United States and Alaska, which contains data on the catch and ex-vessel value of fishery products, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the production and value of manufactured fishery products and byproducts. The statistical surveys, conducted during 1958 for 1957 data, covered all sections of the United States. The catch of fishery products in all sections of the United States and Alaska during 1957 totaled approximately 4.8 billion pounds, valued at \$351 million exvessel -- a decrease of 9 percent in quantity and 5 percent in value as compared with 1956.

Menhaden landings amounted to 1.7 billion pounds, and accounted for 35 percent of the total domestic catch of fish and shellfish. The Chesapeake area was the only region showing an increase in menhaden production.

Shrimp was again the most valuable single item taken by domestic fishermen, amounting to 204 million pounds valued at over \$73 million ex-vessel. The Gulf of Mexico is the major shrimp-producing area and accounted for 83 percent of the volume and 87 percent of the value of the total 1957 shrimp catch. Commercial quantities of small shrimp from Washington and Oregon, which became significant in 1956, registered important gains in 1957.

Several of the major food fish recorded noteworthy increases during the year: Pacific mackerel (up 12 million pounds); jack mackerel (up 6 million pounds); Maine sea herring (up 13 million pounds); and crabs (up 28 million pounds). One of the outstanding production gains made in the commercial fisheries was in the newly-developed New England otter-trawl fishery for industrial fish used in the manufacture of fish meal, oils, and animal food. During 1957, landings by otter-trawl craft of fish classified as industrial fish (189 million pounds) were 50 million pounds or 36 percent greater than in 1956. A sharp decline in the landings of menhaden, salmon, and tuna; and a falling off in the catches of anchovies. Atlantic ocean perch, haddock; Pacific sardines, and shrimp were primarily responsible for the decline in the 1957 landings as compared with the previous two years.

The pack of canned fishery products in the United States, Alaska, Hawaii, Puerto Rico, and

American Samoa in 1957 amounted to nearly 992 million pounds valued at \$336 million to the packers. Production of fresh and frozen packaged fish fillets and steaks in the continental United States totaled 154.5 million pounds, valued at 46.8 million dollars to the processors. This represented a decrease of 8.3 million pounds in volume and 579 thousand dollars in value as compared with the previous year.

United States foreign trade in fishery products in 1957 was valued at over 333 million dollars, of which 297 million dollars represented the value of imports and 36 million dollars the value of exports. The value of imported fishery products in 1957 established a new record over 1956, the former high year. Some of the most important imports during 1957 were fresh sea herring, frozen albacore, canned tuna in brine, and fresh and frozen groundfish fillets and steaks (including blocks and slabs). The value of exports of fishery products was 9 percent less than in 1956.

The economic data presented in this report are essential for use by persons engaged in the commercial fisheries and by governmental agencies concerned with the regulation and protection of commercial fisheries. Biological information included, which is important to sound fishery management, provides detailed information of fluctuations in the commercial catch by species, locality, gear, and type of craft operated.

Life History of the Threespine Stickleback GAS-TEROSTEUS ACULEATUS (Linnaeus) in Karluk Lake and Bare Lake, Kodiak Island, Alaska, by John Greenbank and Philip R. Nelson, Fishery Bulletin 153 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 537-559, illus., printed, 25 cents, 1959.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

1957 Annual Report, Report No. 9, 123 pp., illus., printed. Alaska Department of Fish and Game, Juneau, Alaska. This report covers the activities of the Alaska Fish and Game Commission and the Alaska Department of Fish and Game for 1957. The statistical tables cover the preceding 10-year period, while the financial statement is based on the fiscal year from July 1, 1957 through June 30, 1958. The 1957 activities of the Biological Research Division continued the four field studies under way in 1956 on Taku River salmon, Kitoi Bay red salmon, Southeast Alaska silver salmon, and Kodiak king crab. This report also describes predator investigation and control, commercial fisheries, and sport-fish programs. The statistical part of the report contains data on the comparative

value of canned salmon by species, 1948-1957; number of canneries and salmon pack, 1948-1957; salmon catch by species, gear, and district, 1948-1957; poundage and value of Alaska fisheries landings, 1948-1957; and poundage and value of Alaska fisheries products prepared for market, 1948-1957. The report concludes with a discussion of future plans of the Department.

ANIMAL FEEDING:

"Exploratory Rat and Chick Bioassays of Scales from Ocean Perch and Herring as Animal Feed," by N. I. Lemack, G. E. Livingston, L. R. Parkinson, C. R. Fellers, and D. L. Anderson, article, Food Research, vol. 23, November-December 1958, pp. 684-692, printed. Food Research, Department of Food Technology, University of California, Davis, Calif.

ANTIBIOTICS:

"Distribution of Chlortetracycline (CTC) Antibiotic in Ice Made from Hard Waters," by R. H. Moyer, B. A. Southcott, and H. L. A. Tarr, article, Progress Reports of the Pacific Coast Stations, No. 112, December 1958, pp. 21-22, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

AUSTRALIA:

Australian Journal of Marine and Freshwater Research, vol. 10, no. 1, May 1959, 129 pp., illus., printed. Australian Journal of Marine and Freshwater Research, Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne, C. 2, Victoria, Australia. Contains, among others, the following articles: "The Populations of Australian 'Salmon,' Arripis trutta (Bloch & Schneider), in Australian Waters," by W. B. Malcolm; "Factors Influencing the Settling of the Principal Marine Fouling Organisms in Sydney Harbour," by B. Wisely; and "Reproduction in Australian Pearl Oysters (Lamellibranchia). V--Pinctada fucata (Gould)," by D. J. Tranter.

BELGIUM:

Rapport Annuel sur l'Evolution de la Flotte de Peche en 1958 (Annual Report on the Progress of the Fishing Fleet during 1958), 43 pp., illus., processed in French. Ministere des Communications, Administration de la Marine, Brussels, Belgium. A statistical report on the status of Belgium's fleet of vessels used in high seas and coastal fishing.

BIOCHEMISTRY:

Fatty Alcohol Esters, by Joseph W. Rizzo, U. S. Patent 2,801,934. U. S. Patent Office, Washington 25, D. C.

"On the Formation of Amine in Fish Muscle. VII-Effect of Freezing on the Histamine Formation in the Thawed Fish Muscle," by Fuyuo Ota, and Kosuke Kaneko, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 2, 1958, pp. 140-143, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

CAMBODIA:

Report on Fisheries in Cambodia, by John E. Bardach, 55 pp., illus., printed. Fisheries Service, USOM/Cambodia, Phnom Penh, Cambodia, June 1959. A detailed report on various aspects of Cambodian fish and fisheries. It covers hydrographic features underlying Cambodian fisheries, leading features of the fish fauna, fishing methods, spawning locations and migrations, food of some Cambodian fresh-water fish, fish culture, volume of production and trade, and utilization of the Cambodian fish catch. It also describes the administration of the fisheries in Cambodia and gives a summary of conservation and other recommendations. The author states that, "The report, it is hoped, will be instrumental in maintaining Cambodian fish production, in pointing to certain conservation problems now prevailing, and in suggesting some measures by which production for home consumption and export could be increased."

CANADA

Journal of the Fisheries Research Board of Canada, vol. 16, no. 3, May 1959, pp. 247-386, illus.,
printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, the following articles: "Effects of Some
Aspects of Environment on the Distribution of
Juvenile Herring in Barkley Sound," by Alan S.
Hourston; "The Relationship of the Juvenile Herring Stocks in Barkley Sound to the Major Adult
Herring Populations in British Columbia," by
Alan S. Hourston; "Variations in Annual Average
Weights of British Columbia Pink Salmon, 19441958," by Harold Godfrey; and "Mesh Selection
in Herring Gill Nets," by Steinar Olsen.

Statistiques des Pecheries Maritimes, 1956-1957 (Maritime Fisheries Statistics, 1956-1957), 71 pp., illus., printed in English and French. Presents statistics of Quebec's maritime fisheries for the years 1956 and 1957. The first part describes 28 districts or fishing centers of the Province. The other two parts contain statistics for 1956 and 1957; the first on the quantities of fish caught and their value; the second on the labor force and equipment.

CANNED FISH:

The Formation of Magnesium-Ammonium-Phosphate Crystals in Canned Seafoods. Part 6-Influence of Contained Substances Upon the Growth of the Formed MgNH4PO4·6H2O Crystals in Test Tubes; Part 7--The Formation of the Separated Microscopical Crystal and Its Incipient Growth; Part 8--The Formation of the Crystals During Processing of the Cans," by E. Tanikawa, Y. Nagasawa, and T. Sugiyama; articles, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 8, no. 2, August 1957, pp. 115-146, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"The Formation of Magnesium-Ammonium-Phosphate Crystals in Canned Seafoods. Part 9-Method for Preventing the Formation of Crystals During Processing of Cans; Part 10-General Considerations," by E. Tanikawa, Y. Nagasawa, and T. Sugiyama; articles, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 8,

no. 3, November 1957, pp. 195-213, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

CANNING:

"Methods for Canning Suckers," article, Trade News, vol. 10, no. 10, April 1958, p. 16, printed. Department of Fisheries, Ottawa, Canada.

DEHYDRATION:

"New Developments in Dehydration," by D, K. Tressler, article, Refrigerating Engineering, vol. 66, no. 3, March 1958, pp. 50-51, printed. Refrigerating Engineering, 40 W. 40th St., New York 18, N. Y.

DOGFISH:

"What Shall We Do with the Pesky Dogfish?" by H. L. A. Tarr, article, Western Fisheries, vol. 56, no. 5, August 1958, p. 16-18, illus., printed. Roy Wrigley Publications Ltd., 1104 Hornby St., Vancouver 1, B. C., Canada.

ECHO-SOUNDERS:

"Ein Neuartiges Echoaufzeichnungsverfahren" (A New Method of Recording Sounds), by H. Kietz, article, Allgemeine Fischwirtschaftzeitung, vol. 10, no. 17/18, April 1958, pp. 26-27, illus., printed in German. Verlag Carl Th. Gorg, Post-fach 269, Bremerhaven-F, W. Germany. From the practical standpoint, it is better to record fish traces in black while the sea bottom is recorded gray. This has been developed with the Atlas echo-sounders. This method of recording has the advantage that the more weaklyrecorded sea-bottom echoes can never overlap the stronger fish traces. This is even prevented when there is a heavy sea. Moreover, the new method has the advantage that by recording weak traces from the bottom, lesser dust (caused by the burning of the recording paper by echoes) is developed and the echo-sounders will not get so clogged with burned paper so quickly.

ELECTROFISHING:

"Die Elektroden und deren Anordnung bei der Elektrofischerei" (The Electrodes and Their Arrangement in Electrofishing), by H. W. Hattop, article, Deutsche Fischerei Zeitung, vol. 5, no. 5, May 1958, pp. 148-152, printed in German. Neumann Verlag, Radebeul, E. Germany.

"Die Moglichkeiten der Bewirtschaftung von Stehenden Gewassern und Flusslaufen mit Hilfe der Elektrofischerei" (Electrofishing in Stagnant Waters and Rivers), by H. W. Hattop, article, Zeitschrift fur Fischerei und deren Hilfswissenschaften, vol. 7, no. 1/2, 1958, 90 pp., illus., printed in German. Neumann Verlag, Radebeul, E. Germany.

FILLETS:

"Some Problems of Transient-State Conduction in the Cooling of Fish Fillets," by D. L. Nichol, article, Journal of the Science of Food and Agriculture, vol. 9, February 1958, pp. 78-82, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London SW. 1, England.

FISH-LIVER OIL:

"Studies on Shark Liver Oil. Part 1--Physico-Chemical Constants and Vitamin A Content of Liver Oil from Sharks off the Karachi Coast," by Ali Maqsood, Abdul Haq, and S. Mahdihassan, article, Pakistan Journal of Scientific and Industrial Research, vol. 1, no. 1, January 1958, pp. 70-72, printed. Pakistan Journal of Scientific and Industrial Research, Lahore, W. Punjab, Pakistan.

FISH MEAL:

"Covering Stacks of Cured Fish Meal," by G. H. Stander, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, 1957, p. 24, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa.

"Curtailment of Malodor from Flame Fish Meal Driers," by R. H. Wright and F. E. Murray, article, Canadian Fisherman, vol. 45, no. 7, July 1958, pp. 11-13, illus., printed. National Business Publications Ltd., Gardenvale, Quebec, Canada.

"La Production de Farine de Poisson en Colombie Britannique" (Fish Meal Production in British Columbia), article, La Peche Maritime, vol. 37, no 962, May 20, 1958, pp. 287-289, illus., printed in French. La Peche Maritime, 190, Blyd. Haussmann, Paris 8, France.

FISH MEAL AND OIL:

"Some Trends in the Norwegian Fish Meal and Oil Industry," article, Norwegian Fishing News, vol. 5, no. 3, 1958, pp. 6-8, printed. Norwegian Fishing News, Ltd., Bergen, Norway.

FISH OIL:

"Chemical Essentials to the Discoloration of Fish Oil," by Junsaka Nonaka, article, Journal of Tokyo University of Fisheries, vol. 43, 1957, pp. 127-165, printed. Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Isolation and Structure of the C₁₆ Unsaturated Fatty Acids in Menhaden Body Oil," by Willy Stoffel and E. H. Ahrens, Jr., article, Journal of the American Chemical Society, vol. 80, December 20, 1958, pp. 6604-6608, printed. American Chemical Society, 1801 K St., N. W., Washington, D. C.

"Studies on the Nutritional and Physiological Effects of Thermally Oxidized Oils," by O. C. Johnson, E. Perkins, M. Sugai, and F. A. Kummerow, article, Journal of the American Oil Chemists' Society, vol. 34, no. 12, pp. 594-597, printed. The American G.i Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

FISH SCHOOLS:

"An Attempt to Determine the Swimming Speed of Fish Schools with the Fish Finder--Preliminary Report," by Saburo Kawada, Yozo Tawara, and Chosei Yoshimuta, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, pp. 1-4, printed in Japanese with English abstract. Japanese Society of Scientific

Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

FLORIDA:

"Florida Fresh Water Fish and Fishing," 20 pp., illus., printed. Game and Fresh Water Fish Commission, Talahassee, Fla. A handy booklet which discusses fresh-water sport fishing in Florida. Presents sections on popular fishing methods, favorite fishing spots, fishing Florida waters, largemouth black bass, chain pickerel, bream, shellcracker, speckled perch, redbreast, warmouth, stumpknocker, flier, and rock bass. It also covers other fresh-water fish and other information about fishing in Florida

FOOD AND CONTAINER RESEARCH:

Activities Report, vol. 11, no. 1, first quarter, April 1959, 54 pp., illus., printed. Research and Development Associates, 1849 W. Pershing Rd., Chicago 9, Ill. Relates to food and container research and development work of the Quartermaster Food and Container Institute for the armed forces together with related information pertinent to improving military rations; also relates to activities of other governmental, industrial, or institutional groups engaged in food and container research of direct or indirect applicability to national defense. Of special interest is an article entitled "Preservation of Food by Radiation," which describes the research program dealing with the potentialities and limitations of the radiation preservation of foods. The author states that "Progress to date lies in two broad areas. First, preliminary successes have been achieved in several phases of the food radiation process which are of prime importance to the Department of Defense. Second, sound organizational groundwork has been established to encourage, organize, produce, and disseminate the information needed to irradiate food. Despite the obstacles that lie ahead, the program for the preservation of foods by radiation has shown much progress since its inception, with good hopes of final success."

FRANCE:

"Saint Jean de Luz, 1^{er} Port Thonier de France" (Saint-Jean-de-Luz, the Leading Tuna Fishing Port of France), article, <u>France Pêche</u>, vol. 40, no. 26, February 28, 1959, pp. 13-20, illus., printed in French with English abstract. France Pêche, 84, Rue Carnot, Lorient, France.

FREEZING:

"Calculating Freezing Time of Fish in Air-Blast Freezers," by F. L. Levy, article, Journal of Refrigeration, vol. 1, no. 3, March/April 1958, pp. 55-58, illus., printed. Foxlow Publications Ltd., 19 Harcourt St., London W. 1, England.

"Fish Handling and Freezing. III.--Changes During Freezing and Frozen Storage," by W. A. Empey, article, Food Preservation Quarterly, vol. 18, December 1958, pp. 76-78, printed. Commonwealth Scientific & Industrial Research Organization, Div. of Food Preservation and Transport, Hoembush, N. S. W., Australia.

"The Freezing of Cod Liver," by A. Kaminarskaya, article, Kholodil'naia Tekhnika, vol. 2, 1959, pp. 45-46, illus., printed in Russian with English summary. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

"Rates of Freezing and Temperatures of Storage," article, D. S. I. R. Food Investigation Report for 1956, pp. 11-12, printed. Her Majesty's Stationery Office, York House, Kingsway, London, W. C. 2; England, 1957, The recommended code for the quick-freezing of fish requires cooling through the critical range 32 to 23 F. in not more than 120 minutes. Recommended practice for storage is a temperature of -4 to -20 F.

"Spray- vs. Immersion-Brining of Hake Fillets for Quick Freezing," by A. G. Pienaar, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, 1957, pp. 16-17, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa.

FREEZING AT SEA:

"Prawns Frozen at Sea," article, Refrigeration Journal, vol. 11, no. 9, March 1958, pp. 14-15, illus., printed. Refrigeration Journal, Australian Institute of Refrigeration, 156 Pelham St., Carlton, Victoria, Australia.

FREEZING FISH AT SEA:

"Some Modern Developments in Fish Freezing and Storage Equipment for Ships, Part 1," by M. B. F. Ranken, article, The Fishing News, no. 2369, September 12, 1958, p. 9; "Part 2-Modern Developments in Freezing and Storing in Trawlers," article, The Fishing News, no. 2370, September 19, 1958, p. 7, printed. Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London E. C. 4, England.

FROZEN FISH:

"Expressible Fluid of Fillets: Part 6--Electrophoretic Analysis of the Expressible Fluid of Cod Muscle," by J. J. Connel, article, Journal of the Science of Food and Agriculture, vol. 8, no. 13, December 1957, pp. 701-706; "Part 7--Freezing Damage and Protein Denaturation Under Pressure," by R. M. Love and O. Karsti; "Part 8--Cell Damage in Slow Freezing," by R. M. Love; "Part 9--Other Types of Cell Damage Caused by Freezing," by R. M. Love, articles, Journal of the Science of Food and Agriculture, vol. 9, no. 5, May 1958, pp. 249-268, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England.

GEAR:

"Experiments to See the Effect of Color and Its Depth on the Driving Net by the Centralizing Method," by Takaya Kusaka, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 12, 1958, pp. 766-769, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Un Nouveau Type de Chalut" (A New Type of Trawl), by Robert Lenier, article, France Peche, vol. 40, no. 26, February 28, 1959, pp. 30-34, illus., printed in French with English abstract. France Peche, 84, Rue Carnot, Lorient, France.

"The Specification of Fish Pound Boards," by G. C. Eddie and J. J. Waterman, article, World Fishing, vol. 7, no. 7, July 1958, pp. 65-66, printed. John Trundell Ltd., Temple Chambers, Temple Ave., London E. C. 4, England.

GENERAL:

"FTC and Guides Against Deceptive Pricing," by Charles E. Grandey, Small Marketers Aids no. 42, April 1959, 4 pp., printed. Small Business Administration, Washington 25, D. C. This leaflet describes the Federal Trade Commission's publication, "Guides Against Deceptive Pricing," which attempts to point out to the business community the legal boundaries of pricing representations, and put the spotlight on advertising evil. That evil--deceptive advertising-has misled the public in its purchases and worked a competitive hardship on merchants who advertise honestly. The guides are directed against nine major types of fictitious pricing: (1) savings claims; (2) pricing problem; (3) comparable merchandise; (4) special sale prices; (5) "two-for-one sales;" (6) special sales claims; (7) "factory" and "wholesale" ads; (8) fictitious pre-ticketing; and (9) comparative prices.

"How Better Business Bureaus Help Small Business," by Robert J. Bauer, Small Marketers Aids no. 43, pp. 1-4, printed. Small Business Administration, Washington 25, D. C., May 1959.

"The Mohole," by Willard Bascom, article, Scientific American, vol. 200, no. 4, April 1959, pp. 41-49, illus., printed. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. The author discusses a proposal to drill a hole through the earth's crust beneath the floor of the ocean to reach the interior of the earth. He states that a floating drilling station anchored in water three miles deep and capable of drilling into the bottom another 18,000 feet may do the job. The total reach of the drill pipe must be two miles longer than that used in the deepest hole yet drilled. But the hole will return such valuable direct evidence about the composition of the earth and its geological and biological history that it seems well worth the effort."

We Come From the Sea, by Hans Hass, translated from German by Alan Houghton Brodrick, 288 pp. illus., printed, \$6.50. Doubleday & Co., Garden City, N. Y. Picture-and-text study of marine life by marine biologist and skin-diver.

GILL NETS:

"Comparison Efficiency of Differently Colored Gill Nets in the North Sea Salmon Fishing," by A. Koike, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, pp. 9-12, printed in Japanese with English summary. Bulletin of the Japanese Society of Scientific Fisheries, c/o Tsukishima, Chuo-ku, Tokyo, Japan.

ISRAEL:

Bamidgeh-Bulletin of Fish Culture in Israel, vol. 11, no. 1, April 1959, 52 pp., illus., printed in English and Hebrew. Joint Agricultural Extension Center, Division of Fisheries, Ministry of Agriculture, Tel Aviv, Israel. Contains the following articles: "Chemical Fluctuations of the Water of Fertilized and Unfertilized Fishponds in a Subtropical Climate," by B. Hepher; "The Problem of 'Wild' Spawning and Its Use in the Carp Ponds," by Aza Ben-Ari; "Instructions for the Construction and Repair of Fish Ponds," by J. Pruginin and Aza Ben-Ari; and "Rentability of Chemical Weed Control in Drainage Canals," by J. Pruginin.

Fishermen's Bulletin, no. 19, March 1959, 32 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, P.O.B. 699, Haifa, Israel. Contains, among others, the following articles: "Chapters on the Expansion of Israel Fishing in Lake Tiberias," by M. Nun; "The Use of Copper Naphtenate and Other Copper Soaps for the Treatment of Fishing Nets," by J. H. White and B. Komarovsky; "Tuna Fishing on F/V Shinio Maru," by J. Carmel; "Experiments with the Danish Trawl Net on R.F.V. Hazwi," by D. Bernstein; "Trawler and Trawl Gear in Action," by M. Ben-Yami; "Japanese Long-Line Tuna Fishing Experiment at Eylath," by Z. Fried; and "Israeli Shrimp Export (1957-1958)."

JAPAN:

Bulletin of Tokai Regional Fisheries Research Laboratory, no. 22, December 1958, 61 pp., illus., printed in Japanese with English summaries. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-Ku, Tokyo, Japan. Includes, among others, the following articles: "Bottom Character of Pearling Bed in the Arafura Sea. I -- Size Distribution and Mud Contents of the Thursday Island and East Re-gions," by Y. Takemura; "On the Optimum Temperature and Salinity for the Development of Hard Clam, Meretrix meretrix lusoria (Roding)," by J. Sagara; "Studies on Trawl-Net. H--Determination of the Angle of Inclination of Triangular Brackets Giving the Optimal Angle of Attack to the Otter Board," by S. Takayama and T. Koyama; "Fundamental Study of the Detection of Fish by Supersonic Wave. I--Preliminary Tests on the Supersonic Reflection of Fish and Fishing Net with a 50 kc. Supersonic Fish Finder," by S. Takayama and C. Yoshimuta; "The Vitamin B6 Content of Fish Liver," by M. Yanase; and "Fluorodermin, a Newly Found Fluorescent Hydrocarbon in the Skin of Fishes," by S. Hirao and R. Kikuchi.

Encyclopaedia Zoologica Illustrated in Colours, vol. 2, "Pisces," by Ichiro Tomiyama and Tokiharu Abe; "Prochordata," by Takashi Tokioka, 478 pp., illus., printed, \$25. Hokuryukan, Tokyo, Japan, 1958. This volume illustrates the fishes and prochordates of Japan and is divided into three sections. The first section covers 912 species of marine fishes; the second section, on aquarium fishes, covers 108 species; and the third section, on Prochordates, contains illustrations of 135 species. For each species,

the scientific and common names, a brief description, and size and distribution are given.

Memoirs of the Faculty of Fisheries of Kagoshima University, vol. 7, February 1959, 215 pp., illus. printed in Japanese with summaries in English. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Contains, among others, the following articles: "Studies on the Life Histories of the Flying-Fishes Found in the Adjacent Waters of Japan--I," by Sadahiko Imai; "Correlation Between the Movement and Appearance of Fish School," by Toshiro Kuroki; "Fundamental Studies on the Relations Between Underwater Sound and Fish Behaviour. III--About the Echoless-Wall of Aquarium," by Toshiro Kuroki; "On the Fluctuation of Mackerel-Long-Line Catch Under the Influence of the Solar-Eclipse," by Toyotaka Tanoue; and "On the Fishing Condition of Tuna and Marlin at the Sea Fronts off the Mangoli and Taliabu Islands--I," by Soichi Ueda and Tatsuo Tamari.

LIGHTS AND FISHING:

Japanese Find Blue or Green Lights Catch Most Shellfish," article, The Fishing News, no. 2365, August 15, 1958, p. 13, printed. Arthur J. Heigh-NETS: way Publications Ltd., Ludgate House, 110 Fleet St., London E. C. 4, England.

"Reactions of Fish to Artificial Light, with Special Reference to Large Herring and Spring Herring in Norway," by O. Dragesund, article, Journal du Conseil, vol. 23, no. 2, April 1958, pp. 213-226, illus., printed. Journal du Conseil, Charlottenlund Slot, Denmark.

LOBSTERS:

The Lobster, HOMARUS AMERICANUS, and the Red Crab, GERYON QUINQUEDENS, in the Offshore Waters of the Western North Atlantic, by William C. Schroeder, 17 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 5, 1959, pp. 266-282.) Pergamon Press Ltd., London, England. A population of lobsters, large enough to support commercial fishing, is present off the east coast of the United States along the outer shelf and upper slope between the eastern part of Georges Bank and the offing of Delaware Bay. Although there are all sizes from "shorts" to very large, a much greater percentage than in the shoal water populations are large. Since 1953, several otter trawlers have been fishing offshore exclusively for lobsters and have made very substantial catches in this area. A deepwater crab, as yet unexploited, might become the source of a commercial fishery along the North and Middle Atlantic coast. It inhabits depths between 150-700 fathoms or more and ranges from the offing of Nova Scotia to Virginia and southward, perhaps in diminishing numbers, at least to Cuba.

"Working a Florida Crawfish Boat Can Pay," by W. A. King Webster, article, World Fishing, vol. 8, no. 6, June 1959, pp. 63-71, illus., printed. John Trundell Ltd., St. Richards House, Eversholt St., London N. W. 1, England.

IMARINE ANIMALS:

Dangerous Marine Animals, by Bruce W. Halstead, 176 pp., illus., printed, \$4. Cornell Maritime Press, Cambridge, Md. 1959. This book is divided into four chapters: Dangerous Marine Animals--Our Knowledge of the Past; Marine Animals that Bite; Marine Animals that Sting; and Marine Animals that are Poisonous to Eat. This is followed by a short general selected bibliography on important aspects or groups that have been discussed. In every case, the species identification, geographical distribution, habits, and noxious characteristics are briefly discussed along with the medical aspects, treatment, and prevention.

MIDWATER TRAWL:

"Control of the Midwater Herring Trawl," article, World Fishing, vol. 8, no. 6, June 1959, pp. 44-46, illus., printed. John Trundell Ltd., St. Richards House, Eversholt St., London N. W. 1, England. An account of some Russian experiments which are claimed to have led to much greater accuracy in trawling operations, especially for fleet fishing.

"The Study on the Color of Fishing Net. I--Observations on the Passage of Fishes Through a Colored Net," by Kenji Kanda, Atushi Koike, and Mitio Ogura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 10, 1958, pp. 612-616, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori, 6-Chome, Tokyo, Japan.

"The Study of the Color of Fishing Nets: Part 2--Behavior of Fish Shoals in the Neighborhood of a Colored Net; Part 3--Effect of Depth of Color of a Net on the Behavior of Fish Schools Near the Net," by K. Kanda, A. Koike, and M. Ogura; "Part 4--A Change in Illumination and Behavior of a Fish School Near the Net," by K. Kanda and A. Koike; articles, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, printed in Japanese with English summaries. Bulletin of the Japanese Society of Scientific Fisheries, c/o Tsukishima, Chuo-ku, Tokyo, Japan.

ODORS:

"Tests on the Transfer of Odors and Flavors in Refrigerated Cabinets," by J. Gutschmidt, article, Kaltetechnik, vol. 10, no. 8, August 1958, pp. 255-262, illus., printed. Kaltetechnik, Verlag C. F. Muller, Karlsruhe, Germany.

PACKAGING:

"Packaging Material Odor Can Affect Flavor and Sales of Frozen Fish," by L. B. Sjostrom, Quick Frozen Foods, vol. 20, no. 12, July 1958, pp. 131-134, printed. E. W. Williams Publications, Inc., 82 Wall St., New York 5, N. Y.

PARASITES:

BIVESICULA TARPONIS, a New Trematode in the Tarpon, MEGALOPS ATLANTICUS (Cuv. & Val.), from the West Coast of Florida, by Franklin Sogandares-Bernal and Robert F. Hutton, 5 pp.,

illus., printed. (Reprinted from The Journal of Parasitology, vol. 45, no. 1, February 1959, pp. 114-118.) Florida State Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

Studies on Helminth Parasites of the Coast of Florida. I--Digenetic Trematodes of Marine Fishes from Tampa and Boca Ciega Bays with Descriptions of Two New Species, by Franklin Sogandares-Bernal and Robert F. Hutton, 16 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 1, March 1959, pp. 53-68.) Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla.

POISONOUS FISH:

"Wanted: Poisonous Fish," by Ralph Segman, article, Science News Letter, vol. 75, no. 26, June 27, 1959, pp. 407, 410, illus., printed. Science Service, Inc., 1719 N St., NW., Washington 6, D. C. A unique "fishing expedition" has begun a hunt for venomous and poisonous fish. The author states that "A whole new arsenal of drugs may be squeezed out of deadly fish chemicals."

PORTUGAL:

Boletim da Pesca, vol. XII, no 63, June 1959,

146 pp., illus., printed in Portuguese. Gabinete
de Estudos das Pescas, R. S. Bento, 644, 4°-Esq.,
Lisbon, Portugal. Contains, among others, the
following articles: "Aspectos Tecnologicos da
Preparacao de Bacalhau desde a Captura a Secagem" (Technological Aspects of the Processing of Cod from Its Capture to Drying), by A.
Torres Botelho; and "Da Evolucao das Instalacoes Frigorificas nos Arrastoes Portuguese
de Pesca do Alto" (Development of Cold-Storage
Installations of the Portuguese High Seas Trawl
Fishery), by Adriano Duque Monteiro Leite.

Cooperativa dos Armadores da Pesca da Baleia, Relatorio e Contas do Exercicio de 1958 (Whaling Vessel Owner's Cooperative, Statement of Operations in 1958), 12 pp., printed in Portuguese. Cooperativa dos Armadores da Pesca da Baleia, Lisbon, Portugal.

Gremio dos Armadores da Pesca de Arrasto, Relatorio e Contas do Exercício de 1958 e Orcamento para 1959 (Trawler Owners' Guild, Statement of Operations for 1958 and Budget for 1959), 50 pp., printed in Portuguese. Gremio dos Armadores da Pesca de Arrasto, Lisbon, Portugal.

Gremio dos Armadores da Pesca da Baleia, Relatorio e Contas do Exercicio de 1958 e Orcamento para 1959 (Whaling Vessel Owners's Guild, Report of Operations in 1958 and Budget for 1959), 35 pp., printed in Portuguese. Germio dos Armadores da Pesca da Baleia, Lisbon, Portugal.

PRESERVATION:

Chemical Preservation of Foods, by Hugh L. A.
Tarr, Studies in 1957 from the Stations of the
Fisheries Research Board of Canada, FRB 499,
14 pp. printed. Fisheries Research Board of
Canada, Ottawa, Canada.

"Efficacy of Some Antibiotics as Preservatives for Fresh Tunny," by Noboru Takatsuka, Tadashi Tawara, and Hokoto Ono, article, Bulletin of the Japanese Society of Scientific Fisheries, vol 24, no. 3, 1958, pp. 221-226, printed in Japanese with English abstract. Japanese Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

QUALITY:

"Die Bacteriologische Gestelheid van Geokochte Gebakken vis" (The Bacteriological Condition of Fried Fish), by Br. Melanius and Br. Ansbertus, article, Voeding, vol. 19, no. 3, March 1958, pp. 93-97, printed in Dutch. Voeding, Koninginnegracht 42, The Hague, Netherlands.

"Effect of Chlortetracycline (CTC) Antibiotic on the Keeping Quality of Lingcod Stored in Refrigerated Sea Water," by E. G. Baker, B. A. Southcott, and H. L. A. Tarr, article, Progress Reports of the Pacific Coast Stations, No. 112, December 1958, pp. 15-17, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

"Further Study of the Influence of Short Storage Periods, 3 Days to 2 Weeks at 15 F., on the Quality of Frozen CodStoredat0 F.," by W. J. Dyer, D. I. Fraser, and W. A. MacCallum, article, Journal of the Fisheries Research Board of Canada, vol. 14, no. 6, November 1957, pp. 925-929, printed, Queen's Printer and Controller of Stationery, Ottawa, Canada. Storage for periods of 3 to 14 days at 15 F. caused a very definite deterioration in the quality of frozen fish held under conditions that simulate refrigerated car transportation. This deterioration is equivalent to a loss of 2 to 3 months out of the 2 to 8 months of storage life that normally can be expected from commercially-frozen cod fillets that are stored continuously at 0 F.

"Grading for Quality. Part 1--Trimethylamine Values of Fillets Cut from Graded Fish," by C. H. Castell, M. F. Greenough, R. S. Rodgers, and A. S. MacFarlane, article, Journal of the Fisheries Research Board of Canada, vol. 15, no. 4, July 1958, pp. 701-716, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies on Freshness Determination of Fish Meat by the Distillation Ratio of Volatile Acids, Part 8-On the Form of Volatile Acids in Fish Meat," by S. Asakawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, nos. 7/8, 1957, pp. 463-465, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tsukishima, Chuo-ku, Tokyo, Japan.

"Time-Temperature Tolerance of Frozen Foods. XV--Method of Using Temperature Histories to Estimate Changes in Frozen Food Quality," by W. B. VanArsdel and D. G. Guadagni, article, Food Technology, vol. 13, January 1959, pp. 14-19, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

REFRIGERATION:

"International Survey on Refrigeration Equipment and Activities, 1957," section, Bulletindel'Institut International du Froid, vol. 39, no. 2, 1959, pp. 557-607, printed in English and French. Institut International du Froid, 177, Boulevard Malesherbes, Paris (17⁶), France. The second part of the results of a general survey of refrigeration activities in various countries made in 1958. The first part was published in Issue no. 1 of the Bulletin, 1959.

Kholodil'naia Tekhnika (Refrigeration Journal), vol. 3, 1959, 80 pp., illus., printed in Russian with English summaries. Four Continent Book Corp., 822 Broadway, New York 3, N. Y. Contains, among others, the following articles: "Experimental Investigation of the Freezing-on of Ice in Thin Layers," by N. Kudryashev and "The Centrifugal Purging of Refrigerating Brines of Corrosion Products," by N. Lipatov and N. Mizertskii.

"On the Stability of the Red Skin Pigment of Fish Kept in Ice or Refrigerator," by Y. Tsuchiya and K. Hong, article, Refrigeration (Japan), vol. 33, no. 271, September 1958, pp. 1-6, illus., printed. Nihon Reito Kyokai (Japanese Society of Refrigeration), No. 3, 1-Chome, Ginza Nishi, Chuo-ku, Tokyo, Japan.

SALMON:

Sampling of 1958 B. C. Salmon Catches and Escapements for Age and Sex Composition, by T. H. Bilton, M. P. Shepard, and D. W. Jenkinson, circular no. 52, May 1959, 6 pp., illus., processed. Fisheries Research Board of Canada Biological Station, Nanaimo, B. C., Canada.

SOUTH PACIFIC:

"Norfolk Island Fisheries Survey," by H. van Pel, article, South Pacific Commission Quarterly, vol. 9, no. 2, April 1959, pp. 21, 36, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. A brief article describing the fish which are plentiful around Norfolk Island in the South Pacific area. The author states that transport and marketing are the main problems in the development of commercial fisheries on the island. A whaling station has been established on Norfolk Island and its allotted quota is 120 whales a year. These are humpbacks, caught near the shore during their migrations to and from warmer waters near the equator.

STARFISH:

"Biological Studies on the Population of the Star-fish, Asterias amurensis, in Sendai Bay," by Masayoshi Hatanaka and Masaya Kosaka, article, The Tohoku Journal of Agricultural Research, vol. 9, no. 3, January 1959, pp. 159-178, illus., printed. Faculty of Agriculture, Tohoku University, Sendai, Japan.

STERILIZATION:

"A Esterilizacao de Conservas de Peixe pelo Calor" (Heat Sterilization of Canned Fish), by J. Freixo, article, Conservas de Peixe, vol. 13, no. 150, September 1958, pp. 19-20, printed in

Portuguese. Conservas de Peixe, Regueirao dos Anjos 68, Lisbon, Portugal.

STICKWATER:

"Storage of Stickwater Concentrate," by G. M. Dreosti and A. M. Lewis, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, 1957, pp. 30-31, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa.

TASMANIA:

The Sea Fisheries Regulations, 1950, 32 pp., printed. (Reprinted from Tasmanian Government Gazette, July 5, 1950, pp. 1966-1997.) Government Printer, Hobart, Tasmania, Australia.

TRADE AGREEMENTS:

Trade Agreements Manual (A Summary of Selected Data Relating to Trade Agreements Negotiated by the United States Since 1934), Third Edition, Miscellaneous Series TC 1.16/2:T67, 38 pp., printed, 20 cents. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.) United States Tariff Commission, Washington, D. C., 1959.

TRAWLERS:

'Gefriertrawler mit Heckaufschleppe von Russischen Werften" (Freezing Trawler with Stern Slipway from Soviet Yards), article, Hansa, vol. 95, no. 37, September 1958, pp. 1789-1791, illus., printed in German. C. Schroedter und Co., Stubbenhuk 10, Hamburg 11, W. Germany. To enlarge the utilization of fish, a series of new factoryships, with stern chutes for hauling in the nets, are being built in the U.S.S.R. These ships, though similar to the Pushkin class, carry 20 percent less crew (102 persons). The fish are filleted, packaged, and frozen; the offal is reduced to meal; and liver oil is extracted. Some of the selected livers are canned and the rest is treated in a liver-oil plant with an extractive capacity of 1.6 tons a day. The fish-meal plant has a capacity of 20 tons of offal a day.

TRAWLING:

"Pinta - Ja Valivesi Trooli" (Surface and Mid-Water Trawl), by A. F. Aalberg, article, <u>Kalomiehin Viesti</u>, nos. 1 and 2, February 6 and <u>March 16, 1958</u>, printed in Finnish. Kalomiehin Viesti, Kotka, Finland.

TUNA:

Morphometric Comparisons Among Yellowfin Tuna, NEOTHUNNUS MACROPTERUS, from the Eastern Tropical Pacific Ocean, by Gordon C. Broadhead, 39 pp., printed in English and Spanish. (Reprinted from Inter-American Tropical Tuna Commission Bulletin, vol. III, no. 8, pp. 355-391.) Inter-American Tropical Tuna Commission, LaJolla, Calif., 1959.

Morphometric Comparison of Skipjack from the Central and Eastern Tropical Pacific Ocean, by Richard C. Hennemuth, 66 pp., illus., printed in English and Spanish. (Reprinted from Inter-American Tropical Tuna Commission Bulletin, vol. III, no. 6, pp. 241-304.) Inter-American Tropical Tuna Commission, LaJolla, Calif., 1959.

The Relationships Between Length and Weight of Yellowfin Tuna (NEOTHUNNUS MACROPTERUS) and Skipjack Tuna (KATSUWONUS PELAMIS) from the Eastern Tropical Pacific Ocean, by Bruce M. Chatwin, 48 pp., illus., printed in English and Spanish. (Reprinted from Inter-American Tropical Tuna Commission Bulletin, vol. III, no. 7, pp. 307-352.) Inter-American Tropical Tuna Commission, LaJolla, Calif., 1959.

"Spectral Reflectance Studies of the Heme Pigments in Tuna Fish Flesh, Some Characteristics of the Pigments and Discoloration of Tuna Meat," by John J. Naughton, Harry Zeitlin, and Michael M. Frodyma, article, Journal of Agriculture and Food Chemistry, vol. 6, December 1958, pp. 933-938, printed. American Chemical Society, 1801 K St., NW., Washington, D. C.

"Studies on Canned Tuna. Part 1--Determination of Various Components in Canned Tuna; Part 2--On the pH Determination of Canned Tuna Liquids," by M. Kochi and S. Era, article, Journal of the Shimonoseki College of Fisheries, vol. 7, no. 1, November 1957, pp. 33-42, printed in Japanese with English summary. Shimonoseki College of Fisheries, Yoshimi, Shimonoseki City, Japan.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 7, no. 6, June 1959, illus., printed in Turkish with English table of contents. Balik ve Balikcilik, Yeni Valde Han. Kat 5, Yeni Postane Karsisi, Istanbul, Turkey. Contains, among others, the following articles: "General Effects of Technological Developments on Fisheries," by Bedia Taneri; "About the Technical Problems of Our Fish Canning Industry (Part V)," by A. Baki Ugur; "Tuna in Turkish Sea-Waters and Its Catch (Part III)," by M. Ilham Artuz; "Sarda sarda and Its Catch (Part IV)," by Sitki Uner; and "Photographing the Deep Sea Creatures."

Balik ve Balikcilik (Fish and Fishery), vol. 7, no. 7, July 1959, 26 pp., illus., printed in Turkish with table of contents in English. Balik ve Balikcilik, Yeni Valde Han. Kat 5, Yeni Postane Karsisi, Istanbul, Turkey. Contains, among other items, the following articles: "About the Technical Problems of Our Fish Canning Industry (Part VI)," by A. Baki Ugur; "Tuna in Turkish-Sea-Waters and Its Catch (Part IV)," by M. Ilham Artuz; "Some Information about Packing Cans," by Fehmi Ersan; "About Sharks (Part 1)," by Sitki Uner; and "Among Amateur and Professional Fishermen: An Interview with Sirri Hitay."

UNDERWATER TV:

"Underwater TV and the Fisheries" (Part 1), by Jay Russell, article, World Fishing, vol. 8, no. 6, June 1959, pp. 40-43, illus., printed. John Trundell Ltd., St. Richards House, Eversholt St., London N.W. 1, England. This two-part article describes some of the experiments in which the underwater TV camera has been used, and shows clearly the increasingly valuable role which this research tool can play in adding to knowledge of fish behavior and gear.

UNITED KINGDOM:

Herring Industry Accounts, 1957-58, 7 pp., printed. Her Majesty's Stationery Office, London, England. Scottish Sea Fisheries Statistical Tables, 1958, 47 pp., printed, 5s. (about 70 U. S. cents). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland, 1959. Contains 24 statistical tables of the fish landed and cured, vessels and fishermen, and creek returns. Tables 1 through 17 cover quantity and value of fish landed by British and foreign vessels; landings of British vessels according to method of fishing, 1938-58; quantity, value and average value of each kind of fish landed by British vessels in 1913, 1938, and 1951-1958; quantity and value of each kind of fish landed in specific districts by British vessels of various types; quantity of each kind of fish landed from and expenditure of fishing effort in each fishing region by British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region and quantity and value of fish landed by each nationality; and seasonal landings of herring. Tables 18 through 24 cover quantity of herring cured from 1913 through 1958; quantity and value of white fish cured and herring cured in each district, according to method of cure; fishing vessels; fishermen employed; greatest number of vessels and persons employed by districts in herring fishing; and vessels, fishermen, and quantity and value of fish landed in creeks.

The White Fish Authority, 46 pp., illus., printed.

The White Fish Authority, Lincoln's Inn Chambers, 2/3 Cursitor St., London, E.C.4, England. This booklet is about the white fish industry, which is concerned not only with white fish proper, or demersal fish as it is called, but also with pelagic fish other than herring, and with shellfish. It is very attractively illustrated and tells about the white fish that is eaten in Britain, and the waters where it is caught; about the ways of catching, processing and distributing it; and about the organization and the men who carry out this essential work.

White Fish Authority, Eighth Annual Report and Accounts for the Year Ended 31st March, 1959, 51 pp., printed. Her Majesty's Stationery Office, London, England. Covers the activities and functions of the White Fish Authority for the fiscal year ending March 31, 1959, its income, expenditures, and fishery loans. Also includes sections on production of fishery products, marketing and distribution, research and experiments, training courses, and investigations.

WEST INDIES:

West Indies Fisheries Bulletin, No. 2, March—April 1959, 38 pp., processed. Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad, W. I. Contains, among other items, an article entitled "Fish Culture Prospects in Trinidad and Tobago." a briefout-line of existing inland fisheries is given in this article and the potential for development of four island fisheries is discussed. Of these, fish culture or fish farming shows the greatest potential. The historical background of fish culture is recorded and reference made to the basic problems faced in establishing fish culture as part of the Trinidad economy. Methods of cultivation of tilapia developed at the Bamboo

Grove Station are described with particular reference to preparation of ponds, stocking, fertilization, and harvesting, and a breakdown of cost of production shown. Brief mention is made of the likely areas in Trinidad and Tobago where fish culture may be established on a commercial basis. Other news items include tuna long-line experiments in Antigua, capture of albacore in Barbados, deep-sea fishing in Barbados, and related subjects.

WHALE MEAT:

"Biochemical Conditions of Whale Meat Before or After Freezing and Cold Storage of Frozen Meat," by Kazuo Tanaka and Takeo Tanaka, article, Journal of Tokyo University of Fisheries, vol. 42, 1958, pp. 83-88, printed. Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.



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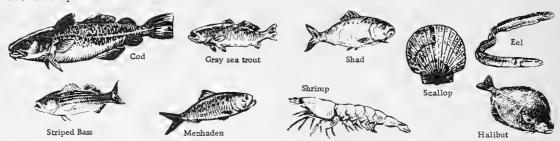
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FISHING FOR FOOD

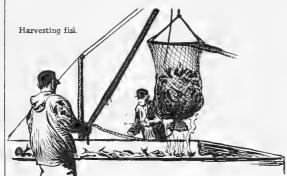
Circular 55, Conservation Notes -- Fishing for Food, describes briefly the need for conservation of the fishery resources and the work of the Bureau of Commercial Fisheries and other fact-finding organizations concerned with orderly harvesting and protection of the available fish.

Men have been fishing for thousands of years but know comparatively little about fish and what affects their abundance and movements. "Sea culture" is a new science and the restlessness of the ocean complicates the efforts.



The supply of fish in the ocean is not inexhaustible and man must practice conservation in the sea just as he is beginning to practice conservation on land.

A most important fact which the fishery conservationist must learn is the 'maximum sustainable yield' of each species--that is, the greatest number which can be harvested each year



and leave enough for harvesting the next year and the next. The conservationist must also know when and where the fish are available; and know when, where, and how many ahead of time and inform the fishermen how to prepare for big harvests or small, as conditions warrant.

But knowing "when, where and how many" is only part of the work of the fishery conservationist. He must be able to tell the fishing industry how to make the best possible catch without damage to the resource; how to get the product to the family table with minimum loss of fish or quality; and how to make the best industrial use of fish not presently used for human food.

Intriguing mysteries which must be solved include: the reason why some species suddenly disappear from their haunts and are missing for years to reappear suddenly in great numbers; the reason for heavy mortality of a species when

known conditions appear normal; the "spark" which causes the "redtide" organism to suddenly increase in numbers, killing millions and millions of fish.

Some recognized dangers: Predators--suchas squawfisha-waiting young salmon at ariver mouth; starfish and drills ruining an oyster harvest; green crabs killing clams; sea lamprey ruining Great Lakes trout fisheries. Obstructions--dams blocking fish runs; irrigation outlets and power

Drill and starfish attacking oysters.

Green crab eating clam.

turbine intakes diverting fish from their course. Silt which covers spawning grounds and shell-fish beds or which ruins aquatic plants by making the water too murky for sunlight to penetrate; water fluctuations which drown out or dry up spawning areas; storms; human activity; domestic and industrial pollution; careless use of pesticides.

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United States Department of the Interior
Washington, D.C.

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE

ARNIE J. SUOMELA, COMMISSIONER

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF INDUSTRIAL RESEARCH AND SERVICES

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Page



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

> Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, May 21, 1957.

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STORAGE LIFE AND ACCEPTABILITY OF SOME NORTH ATLANTIC FISH

By Joseph H. Carver* and Maynard A. Steinberg**

ABSTRACT

Screening studies were performed on raw and on blanched cod, pollock, whiting, and butterfish and on raw flounder irradiated at pasteurization doses ranging from 116,500 to 1,860,000 rads. Although some samples were acceptable when irradiated at the higher dosage level, those samples that were irradiated at levels of 465,000 rads and lower had greater acceptability.

Storage life studies at 35° F. were performed on raw and on blanched cod fillets and dressed butterfish and on raw pollock that had been irradiated at levels of 232,500 and 465,000 rads. In addition, raw pollock was irradiated at a level of 930,000 rads. The storage life extension of the irradiated fish over that of the unirradiated fish stored at the same temperatures was as follows: butterfish—about three times; cod—about two times; and pollock—no appreciable increase. Blanching did not increase the storage life or improve the acceptability of irradiated butterfish and cod. Deep-fat frying considerably increased the acceptability of raw, irradiated cod and pollock.

INTRODUCTION

Considerable literature exists on the preservation of meats, fruits, and vegetables by means of ionizing radiation, but relatively little information has been published on the responses of fishery products to this form of preservation. A study of

the effect of radiation on the chemistry and acceptability of southern oysters has been reported (Gardner and Watts 1957). No definite conclusions were made on the suitability of this technique as it affects acceptance of the product. Low levels of cathode-ray radiation were applied to haddock fillets on a study (Nickerson, Lockhart, Proctor, and Liciardello 1954) of the effects of this treatment on the chemistry and flavor of the product, but storage periods were of relatively short duration. In another study (Nickerson,



Fig. 1 - Preparing sample of irradiated fish for testing by the taste panel.

Proctor, and Goldblith 1956) cod cakes and halibut steaks were treated with cathode rays to determine the effect on flavor. This also was a relatively short-term study. A report has been made on the acceptability of some irradiated foods, including had-

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1/A rad is the quantity of ionizing radiation which results in the absorption of 100 engs per gram of irradiated material.

dock, when incorporated into complete menus (McGary, Shipman, and Bernstein 1956). In this case too, holding times were relatively short.

Iced or refrigerated raw fish have a shelf life of 7 to 15 days. Irradiation offers a potential means of considerably extending this period at storage temperatures of 32° to 45° F. when pasteurizing doses are used. Extension of storage life at ambient temperatures may also be realized when the level of radiation applied is sufficient to result in sterilized products.

OBJECTIVES

The present study was undertaken to determine the effect of pasteurization by irradiation on the useful refrigerated storage life at 35° F. of several commercially-important species of fish caught in North Atlantic waters. The study was divided into two phases.

Phase one consisted of a screening study to determine the organoleptic acceptability of irradiated products after refrigerated storage of not more than a few days.

Phase two consisted of storage-life determinations of samples held at 35° F. after being irradiated at various levels--in one case up to the maximum level as determined in the screening process.

SCREENING STUDY

PROCEDURE: The products examined were raw flounder fillets (Pseudopleuronectus americanus), raw and blanched fillets of cod (Gadus morhua), pollock (Pollachius virens), and whiting (Merluccius bilinearis), and raw and blanched dressed butterfish (Poronotus triacanthus). The fish for the studies were caught 12 to 36 hours before they were received. In the laboratory they were packed in No. 2 Cenamel cans and sealed under a vacuum of 25 inches of water. The fillets that were blanched were heated to an internal temperature of 140° F. and were held at that temperature for 5 minutes and were then canned as described above. All samples were frozen to -20° F. They were then packed with dry ice and were shipped by air to and from the reactor site, where they were irradiated in the frozen state at levels ranging from 116,250 to 1,860,000 rads. On their return to the laboratory the frozen samples were held at 0° F. until they were submitted to the taste panel (fig. 1). This period did not exceed 10 days.

For initial sensory evaluation, the frozen samples were thawed within the cans in cold running water. The raw fish were cooked by being steamed for 20 minutes, and the blanched fish were cooked by being steamed for 15 minutes. Four samples were evaluated at each test. One sample was usually an identified unirradiated fresh control. The taste-panel consisted of 8 to 10 members of the laboratory staff. A hedonic scale ranging from 10 to 90 was used to score the irradiated products, which were evaluated on the bases of flavor, odor, texture, and appearance. A numerical score of 50 or above indicated a commercially-acceptable product.

RESULTS: The radiation dosages that resulted in organoleptically acceptable products for the fish tested are shown in table 1. An increase in dosage for any species frequently resulted in increased off-odors and off-flavors. Bleaching of the meat occurred in raw cod, pollock, black-

Table 1 -	Irradiation	Doses Resulting i	n Acceptable	Cod, Pollock,								
Blackback, and Whiting Fillets, and Dressed Butterfish												
Maximum Dose Resulting Dose Resulting in Products of												
Species in Acceptable Products of Greatest Acceptability												
Raw Fish Blanched Fish Raw Fish Blanched Fish												
		(Ra	ds)									
Cod	465,000	232,500	116,250	232,500								
Pollock	232,500	930,000	232,500	232,500								
Blackback.	930,000	_	465,000	-								
Whiting	116, 250	232,500	116,250	116, 250								
Butterfish .	697,500	930,000	232,500	232,500								
Note: The	Note: The irradiated fish were cooked in steam for taste-panel evalua-											
tion.												

back, and butterfish, even at the lowest dosage employed (116,250 rads). Raw whiting exhibited a slight pink discoloration at the lowest dosage level, and this discoloration became more severe as the dosage level was increased. Blanching changed the discoloration pattern in that the meat of irradiated pollock, whiting, and butterfish became slightly gray.

STORAGE STUDY

PROCEDURE: Storage studies consisted of an examination of raw and blanched cod fillets, raw pollock fillets, and raw and blanched dressed butterfish. The fish were irradiated at levels of 232,500 and 465,000 rads except for one additional lot of pollock fillets that was irradiated at a level of 930,000 rads. Despite the finding that, with some species, irradiation at levels higher than 465,000 rads resulted in acceptable products, the relatively low levels of 232,500 and 465,000 rads were used because irradiation at these levels resulted in products of greater acceptability. Levels lower than 232,500 rads were not used because it was felt that they might not be sufficient to prolong the shelf life significantly.

The samples were prepared and shipped as was previously described in the screening study. After irradiation and return of the samples to the laboratory, they were thawed in air and stored at 35° F. Samples were prepared for evaluation by steaming and, in some cases, by deep-fat frying to determine the effect of cooking methods on acceptability. In all cases, unidentified, unirradiated controls were evaluated with the irradiated samples. These controls were usually stored in the frozen state. Where refrigerated, unfrozen controls were used, it is so noted in the tabulated data. The results of the evaluation studies have been tabulated in two ways in order to (1) reflect the over-all acceptability of the samples as arrived at by finding the mean of the total scores given to each sample for the four attributes examined and (2) to indicate as specifically as possible in which particular attributes there were significant differences between controls and experimental samples as a function of storage time and irradiation dose. For this latter purpose, rank score tables were used (Kramer 1956).

RESULTS: Butterfish: The data shown in table 2 indicate that raw butterfish irradiated at 232,500 rads and cooked in steam was acceptable for at least 49 days when stored at 35° F. The maximum commercial storage time in ice for this fish is about 14 days. The unirradiated controls used in these tests had a storage life

Tabl	Table 2 – Taste-Panel Scores and Degrees of Difference Between Raw Unitradiated and Raw Irradiated Butterfish That Were Stored at 35° F. and Cooked in Steam													
		Organoleptic Scores ¹ /												
Storage	Control	Samples Irradiated at 232,500 Rads Samples Irradiated at 465,000 Rads												
Time	Mean Score	Mean Score	an Score Appearance Odor Flavor Texture Mean Score Appearance Odor Flavor Texture											
Days 8 15 23 30 47 48 49	2/82.5 2/72.5 2/73.5 3/71.1 3/67.5 3/62.9 3/74.3	68.3 72.3 75.3 73.5 66.0 6/ 73.0	4)ଠାଠାଠାଠାଠାଠାଠ	4/6/6/6/6/6/6/6	5/6/6/6/6/6/6/6/6/	6)6)6)6)6)6)	68.5 69.5 72.0 75.5 67.5 66.0 56.7	() () () () () ()	4/6/6/6/6/6/6/4/	5/6/6/6/6/6/4/	6/			
	of 49 or less	indicate poor	quality, 50 t	to 59 b	orderlin	e, 60 to 6	9 fair, 70 to	79 good, 80	to 89	very goo	d, and			

2/Refrigerated controls stored at 35° F. 3/Frozen controls stored at 0° F.

4/Different from the control at the 5-percent level of significance.

Different from the control at the 1-percent level of significance.

6/Not significantly different from the control.

of 23 days. This long storage life was probably due to a very low initial bacterial load of the fish stored under essentially anaerobic conditions at 35° F. With respect to appearance, odor, and flavor, significant differences between the unirradiated controls and the samples irradiated at a level of 232,500 rads occurred only on the 8th day of storage. Samples irradiated at a level of 465,000 rads were significantly

different from the controls with respect to odor and flavor at both the 8th and 49th day of storage. When the data in table 2 are analyzed for the entire 49 days of the study, it is found that, regardless of the dose applied, there are no significant differences between the irradiated samples and the frozen controls except for the appearance of the sample irradiated at a level of 232,500 rads. This difference is at the 5-percent level of significance.

Tab	Table 3 - Taste-Panel Scores and Degrees of Difference Between Blanched Unirradiated and Blanched Irradiated Butterfish That Were Stored at 35° F. and Cooked in Steam												
	Organoleptic Scores 1/												
Storage	Control		les Irradiated					les Irradiated					
Time	Mean Score	Mean Score	Appearance	Odor	Flavor	Texture	Mean Score	Appearance	Odor	Flavor	Texture		
Days 9													
9	2/70.0	75.1	4/	4/	4/	4/	70.0	<u>4</u> /	4/	$\frac{4}{}$	4/		
16	<u>2</u> /78.8	70.0	$\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{6}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{4}{5}$										
24	2/71.5	68.8	$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$										
31	3/66.8	<u>4</u> /	4/	4/	4/	4/	62.3	<u>6</u> /	$\frac{4}{5}$	4/	4/		
38	$\frac{3}{70.9}$	61.1	5/			<u>5</u> /	62.3				4/		
1/Scores	of 49 and les	s indicate poo	or quality, 50	to 59	borderli	ne, 60 to	69 fair, 70 t	o 79 good, 80	to 89	very go	ood, and		
90 ex	ccellent.												
2/Refrig	erated control	ls stored at 35	°F.										
	controls store												
	//Not significantly different from the controls.												
	ent from the o												
6/Differe	ent from the c	control at the	1-percent le	vel of	significa	nce.							

Table 3 indicates that the blanched, irradiated butterfish were acceptable for at least 38 days of storage at 35° F. However, further examination of these data shows that with respect to no attribute did enzyme inactivation by blanching result in an improvement of keeping quality over the period studied. Applying the test for significant difference to the storage period as a whole indicates that, at an irradiation level of 232,500 rads, there were no significant differences between the blanched, unirradiated, frozen controls and the irradiated samples. At the 465,000-rad level, the odor and flavor of the frozen controls were preferred, at the 5-percent level of significance, to the odor and flavor of the irradiated samples.

Cod: Raw, irradiated cod were tested over a period of 94 days, as is shown in table 4. At the end of that time, the samples irradiated at a level of 232,500 rads were still considered acceptable, although barely so. The fillets irradiated at a higher dose became unacceptable after 31 days of storage.

	Table 4 - Taste Panel Scores and Degrees of Difference Between Raw Unirradiated and Raw Irradiated Cod Stored at 35° F. and Cooked in Steam													
	 		Organoleptic Scores /											
Storage	Control	Samp	les Irradiated	at 23	2,500 Ra	ıds		les Irradiated						
Time	Mean Score	Mean Score	Appearance	Odor	Flavor	Texture	Mean Score	Appearance	Odor	Flavor	Texture			
Days 3 6 15 24 31 37 55 94	2/80.0 2/85.3 3/79.0 3/79.0 3/79.3 3/81.0 3/78.3 3/79.0	4/ 67.5 62.3 65.3 66.8 50.3 56.7 58.3	414141515151416	4 6 6 6 5 5 5 5 6	4/ 6/ 5/ 5/ 5/ 5/ 6/	4/6/4/5/6/5/6/	71.5 65.5 62.3 63.0 60.3 49.3 54.3 49.0	415141415161516	5/6/6/5/5/5/5/6	416161516161516	5)6)4 6 5)5 5 6			

^{1/}Scores of 49 or less indicate poor quality, 50 to 59 borderline, 60 to 69 fair, 70 to 79 good, 80 to 89 very good, 90 excellent.

A statistical consideration of each attribute over the entire storage period indicates that the frozen controls are uniformly preferred over the samples irradiated at 232,500 and 465,000 rads, at the 5-percent and 1-percent level of significance, respectively.

^{2/}Refrigerated controls stored at 35° F.

^{3/}Frozen controls stored at 0° F.

^{4/}Not significantly different from the control.

^{5/}Different from the control at the 5-percent level of significance. 6/Different from the control at the 1-percent level of significance.

Blanching of cod fillets prior to irradiation did not significantly affect the acceptability of the product, as is shown in table 5, and an examination of these data does not reveal any marked effect on the scores assigned to the individual attributes as a result of blanching. When the entire storage period is treated as one test, it is found that, regardless of the irradiation dose used, or the attribute under consideration, the frozen control is preferred over the irradiated samples at the 1-percent level of significance.

Tabl	e 5 – Taste-I	anel Scores	nd Degrees o Cod Store	f Diffe	erence B 50 F. ar	etween Bl nd Cooked	anched Unirra	diated and B	lanche	d Irradi	ated			
					0	rganolept	ic Scores1/							
Storage	Control	Samp	es Irradiated	at 232	2,500 Ra	ıds	Sampl	es Irradiated	at 465	,000 Ra	ıds			
Time	Mean Score	Mean Score	Appearance	Odor	Flavor	Texture	Mean Score	Appearance	Odor	Flavor	Texture			
Days 3														
3	<u>2</u> /80.0	65.8	4/	5/	6/	<u>6</u> /	-	4/	4/	4/	4/			
6	$\frac{2}{80.9}$	72.0	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$											
16	2/76.8	62.8	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$											
25	<u>3</u> /83.0	54.5	5/	6/	6/	6/	56.5	5/	6/	6/	6/			
32	3/80.3	60.9	6/	6/	6/	6/	60.4	6/	5/	6/	5/			
39	3/70.8	53.0	4/	5/	5/	$\frac{4}{4}$	53.0	$\overline{4}/$	6/	5/	5/			
1/Scores	of 49 or less	indicate poor	quality, 50 t	o 59 b	orderlin	e, 60 to 6	9 fair, 70 to	79 good, 80	to 89 v	rery qoo	d, and			
90 ex	cellent.	•					•	,		, ,				
2/Refrige	erated control	ls stored at 35	°F.											
3/Frozen	controls store	ed at 0° F.												
	Not significantly different from the control.													
5/Differe	5/Different from the control at the 5-percent level of significance.													
6/Differe	nt from the c	control at the	1-percent lev	vel of	significa	ince.					1			

Although experiments with fried cod were few in number, it is clear from an examination of table 6 that deep-fat frying serves to reduce the differences between controls and experimental samples, particularly at the lower level of irradiation.

	Table 6 - Taste-Panel Scores and Degrees of Difference Between Raw Unirradiated and Raw Irradiated Cod Stored at 35° F. and Deep-Fat Fried												
	Organoleptic Scores 1												
Storage	Control2/	Samp	le s Irr adiated	at 23	2,500 Ra	ads	Samp	les Irradiateo	at 46	5,000 R	ads		
Time	Mean Score	Mean Score	Appearance	Odor	Flavor	Texture	Mean Score	Appearance	Odor	Flavor	Texture		
Days 33 58	80.0 77.1 3/ 3/ 3/ 3/ 74.6 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/ 3/												
90 ex 2/Frozen 3/Not sig 4/Differe	of 49 or less excellent. controls store gnificantly dient from the cent from the	ed at 0° F. fferent from toontrol at the	he control. 5-percent le	vel of	significa	ance.	69 fair, 70 to	79 good, 80	to 89	very goo	od, and		

Pollock: Pollock fillets did not respond well to irradiation. Results of the taste panel evaluation of steam-cooked fillets are shown in table 7. Fillets irradiated at the 232,500-rad level had a maximum period of acceptability of 2 to 3 weeks. Fillets irradiated at a level of 465,000 rads were no better than barely acceptable at any

	Table 7 - Ta	iste-Panel Sce Po	ores and Degr llock Fillets	ees of Stored	Differen	ce Betwe	en Raw Unirr oked in Stean	adi at ed and F	Raw Irr	adiated				
	Organoleptic Scores 1/													
Storage	Control2/		Samples Irradiated at 232, 500 Rads Samples Irradiated at 465, 000 Rads											
Time	Mean Score	Mean Score	an Score Appearance Odor Flavor Texture Mean Score Appearance Odor Flavor Texture											
Days			an solid reproductive day 2 area 2 area and a reproductive day 1 area 2											
7	65.0	66.0	3/	3/	5/	3/	54.3	3/	4/	<u>5</u> /	4/			
11	72.5	55.3	$\overline{4}/$	5/	$\overline{4}/$	5/	52.1	3/	5/	4/	5/			
18	70.0	61.7	3/	5/	5/	5/	56.3	3/	5/	5/	3/			
21	67.4	52.6	3/	3/	$ \overline{4} $	4/	46.0	3/	5/	3/	3/			
28	69.8	53.0	$\frac{1}{4}$	3 5 5 3 5 5	5/	4/	39.8	$\frac{7}{4}$	15/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/	5/	5/			
45	69.3	49.3	3/	5/	5/	<u>5</u> /	41.3	3/	5/	4/ 5/ 3/ 5/ 5/	5/			

^{1/}Scores of 49 or less indicate poor quality, 50 to 59 borderline, 60 to 69 fair, 70 to 79 good, 80 to 89 very good, and 90 excellent.

^{2/}Frozen controls stored at 0° F.

^{3/}Not significantly different from the control.

^{4/}Different from the control at the 5-percent level of significance.

5/Different from the control at the 1-percent level of significance.

^{5/}Different from the control at the 1-percent level of significance.

time during the maximum storage period of 2 weeks. Fillets irradiated at a level of 930,000 rads had a storage life of less than 11 days. This latter sample is not included in the tabulated data.

Statistical treatment of the results of this storage period, considered as one test, shows a preference for the controls over all the irradiated samples for each attribute, except "appearance" of the sample irradiated at 232,500 rads. There was no significant difference between the "appearance" of these samples and that of the frozen controls.

T	able 8 - Tast	e-Panel Scor					n Raw Unirra p-Fat Fried	diated and R	aw Irr	adiated			
Organoleptic Scores 1/													
Storage													
Time	ime Mean Score Mean Score Appearance Odor Flavor Texture Mean Score Appearance Odor Flavor Texture												
Days													
12	72.7	78.5	<u>3</u> /	<u>3</u> / 3/	<u>3</u> / 3/	3/	69.0	<u>3</u> /	$\frac{3}{3}$	3/ 3/	<u>3</u> /		
31	76.8	71.0	<u>3</u> /	3/	3/	3/	64.3	3/	3/	3/	$\frac{4}{4}$		
	of 49 or less :	indicate poor	quality, 50	to 59 1	borderlin	e, 60 to 6	59 fair, 70 to	79 good, 80	to 89	very goo	d, and		
2/Refrig	erated control	stored at 35°	F.										
3/Not sic	3/Not significantly different from the control.												
4/Differe	nt from the c	ontrol at the	5-percent le	vel of	significa	nce.							

Table 8 indicates that deep-fat frying had a marked effect on the acceptability of irradiated pollock fillets. The difference in acceptability of steamed and of fried samples at the lower levels of irradiation is striking; however, when the irradiation level is as high as 930,000 rads, the product remains unacceptable regardless of the cooking method.

CONCLUSIONS

- (1) At a storage temperature of 35° F, the shelf life of raw butterfish can be extended about three times by treating the butterfish at a level of 232,500 rads. Irradiating at a dosage level of 465,000 rads or blanching before irradiation resulted in slightly decreased acceptability with no increase in storage life.
- (2) Raw cod fillets irradiated at levels of 232,500 or 465,000 rads and stored at 35° F. were less acceptable than were the unirradiated, frozen controls and had a shelf life of approximately 30 days.
- (3) Blanched cod fillets irradiated at either 232,500 or 465,000 rads and stored at 35° F. were less acceptable than the unirradiated, frozen controls and had a maximum storage life of approximately 30 days.
- (4) Deep-fat frying of irradiated cod fillets markedly increased their acceptability over that of fillets cooked in steam.
- (5) Irradiated raw pollock fillets stored at 35° F. and cooked by being steamed exhibited no useful increase in shelf life over that of unirradiated, unfrozen fillets. Deep-fat frying of irradiated pollock fillets markedly increases their acceptability over that of similar fillets cooked in steam.

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A DISCUSSION OF INFLUENCING FACTORS

By Fredrick Wathne*

SUMMARY

During the spring and summer of 1958, biologists of the Bureau of Commercial Fisheries conducted a population survey of the king crab, Paralithodes camtschatica (Tilesius), in the Southeastern Bering Sea, using an otter trawl. In the course of the investigation, measurements of the trawl-door spread were obtained. These measurements were examined to determine the effect of water depth, vessel speed, and total catch on door spread.

It was found, when using a warp-scope ratio of 3:1, that the spread of the doors was greater in deep water than in shallow water. Door spread in shallow water appeared to decrease with increased vessel speed. There was also some indication that larger catches reduced door spread; however, the relationship was not strong.



Fig. 1 - 75-foot schooner-type vessel Tordenskjold chartered for the king crab survey.

The work of DeBoer (1957) who used especially designed instruments, demonstrated that door spread is largely determined by the degree of contact between the doors and the bottom. The present paper proposes that, when using a small scope * Fishery Methods and Equipment Specialist, Branch of Exploratory Fishing and Gear Research, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

ratio in shallow water, the pull by the warp at the door is upward. This results in the tilting of the door outward and forward as observed by DeBoer. Because contact between the door and the bottom in this case is poor, the spread is small. In deeper water the door theoretically loses its tilt and operates squarely, resulting in good bottom contact and increased spread. In still greater depths the door may tilt back and in. Although the contact would seem to be reduced, the spread increases further. This effect is here interpreted as the probable result of the downward pull by the warp at the door, which forces it into the bottom resulting in better contact and increased spread.

BACKGROUND

During the spring and summer of 1958, biologists of the U. S. Bureau of Commercial Fisheries conducted a population survey of the king crab, Paralithodes camtschatica (Tilesius), in the Southeastern Bering Sea. In the course of the trawling operations, records of distance traveled, cable scope, and catch were kept, and measurements of trawl-door spread were obtained. Data collected were made available to the Bureau's Branch of Exploratory Fishing and Gear Research for evaluation of the effects of these variables on the spread of the trawl during fishing. The measurements of door spread were taken to assist in a population study and were not specifically designed to accrue information for gear evaluation. Controlled experiments covering various depth ranges and speeds were not conducted. The observed relationships, therefore, should be considered as qualitative rather than quantitative.

GEAR AND METHODS

A 75-foot schooner-type vessel, the M/V Tordenskjold, was chartered for the survey (fig. 1). The vessel, powered by a 180 hp. engine, has a mean draft of 9 feet and a beam of 18 feet. The trawling gear, typical of Pacific coast trawlers, was towed from davits on each side of the stern and hauled over the starboard side. A 400-mesh eastern otter trawl, with a 71-foot headrope and a 94-foot groundrope, was

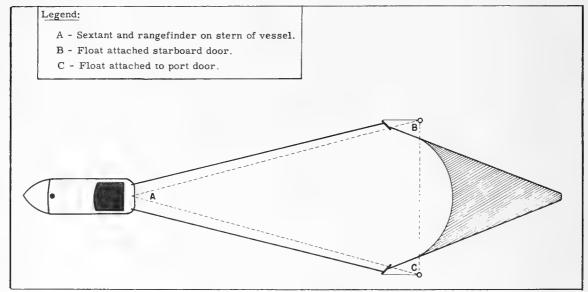


Fig. 2 - Angles and distances measured to determine door spread.

fished using 3 by 6-foot doors weighing approximately 550 pounds each. Seven-fathom extensions were added forward of each wing and the extended wings were secured directly to the doors.

The spread of the doors, while trawling, was determined as follows: Spherical floats, 18 inches to 20 inches in diameter, were secured to the doors with 100 fathoms of $\frac{1}{16}$ -inch stainless-steel cable. Since all fishing was conducted in waters shallower than 80 fathoms, this amount of cable insured that the floats would reach the surface while the gear was being towed. The angle between the floats, from a point



Fig. 3 - The "lawn roller" meter used to measure the distance traveled by the trawl on the bottom-developed by the Fisheries Instrumentation Laboratory, U. S. Fish and Wildlife Service, Seattle, Wash

on the stern of the vessel, was measured with a sextant, and the distance from this point to the floats was measured with a U. S. Navy range finder. The distance between the doors was obtained by solving the triangle formed by the vessel and the floats (fig. 2). This method is similar to that used by Carlson (1952).

The distance traveled by the trawl on the bottom was measured by a meter attached to the cod end (fig. 3). The meter was equipped with two counters that made independent readings. This served as a check and insured a measurement in the event that one counter malfunctioned. The speed of the vessel was calculated by relating the measured distance to the dragging time.

RESULTS

During the survey a total of 120 drags was made, of which 91 were used in this analysis.

These drags were made at depths ranging from 20 to 62 fathoms and at vessel speeds from 2.0 to 3.0 knots. The total catch per drag ranged between 350 and 5,000 pounds.

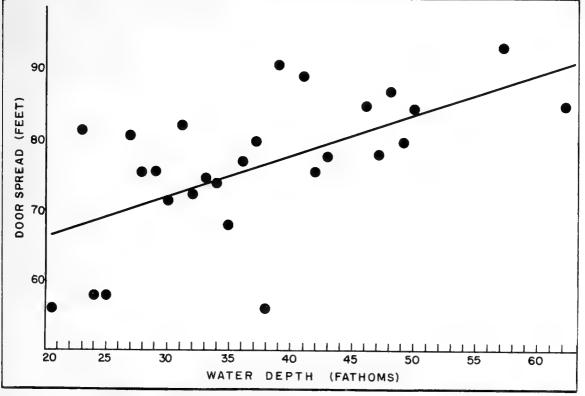


Fig. 4 - The relationship between water depth and door spread.

DEPTH AS RELATED TO DOOR SPREAD: The average door spread per drag, using a constant scope ratio 1/(2.9-3.1) to 1), as related to water depth is shown in figure 4. The results demonstrate a greater spread as the water depth increases. This suggests that a scope ratio of 3:1 was not adequate for obtaining the maximum spread of this trawling gear in shallow water. The need for greater scope ratios in shallow water is in agreement with the observations of numerous investigators, including Miyamoto (1957). Saito (1957) and Bullis (1951) report that fishermen use scope ratios greater than 3:1 in shallow waters. DeBoer (1957), using various scope ratios in a constant water depth ($8\frac{1}{2}$ fathoms), demonstrated a progressive increase of door spread with scope ratios varying from 3.4:1 to 8.1:1.

DOOR SPREAD AS RELATED TO VESSEL SPEED: To minimize bias due to the effect of increasing door spread with increasing depth, the data have been separated into two groups: drags at 38 fathoms and shallower, and drags deeper than 38 fathoms. The relation of vessel speed to door spread is shown in figure 5. In shallow water there is a tendency for the door spread to decrease with greater speeds, but in deeper water this trend is not apparent. A decrease in door spread in shallow water, following increased vessel speed, is consistent with the results obtained by Ketchen (1951).

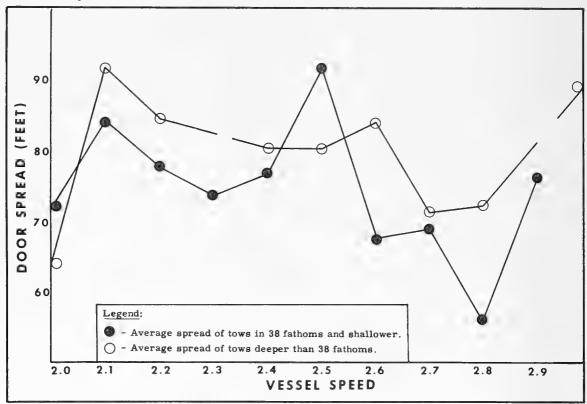


Fig. 5 - The observed relationship between vessel speed and door spread.

DOOR SPREAD AS RELATED TO TOTAL CATCH: In evaluating the effect of catch on door spread, the data were again separated into shallow and deep drags, using the depth of 38 fathoms as a division point. An effect of total catch on door spread (fig. 6) is not apparent. It is possible that catches of greater magnitude than those that were obtained are necessary to affect door spread, or that inter-drag differences, independent of catch, mask this effect. To preclude inter-drag variance, the average of the deviations of individual observations, taken at specific time inter-1/Ratio of towing cable out to water depth.

vals, from the average within drag spread were calculated and the resulting points were plotted (fig. 7). Using this technique, a trend of decreasing spread with increased dragging time is indicated. The spread of the doors apparently decreases

as the dragging time progresses, presumably because of increased catch. The relationship, however, is not strong; and as previously noted, the size of the catches may have been insufficient to markedly affect door spread.

FACTORS AFFECTING DOOR SPREAD

The foregoing observations between scope ratio, speed, and door spread are in agreement with experiments and observations of other research workers directed at the evaluation of these factors. The confirmation of those previous

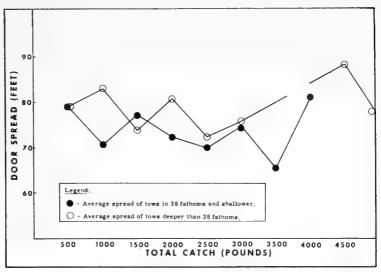


Fig. 6 - The observed relationship between total catch and door spread.

studies, however, is primarily of academic interest in that it offers little more quantitative knowledge than is already available. The variation in spread between drags, observed in this study, demonstrates the wide variability in behavior of the trawl in

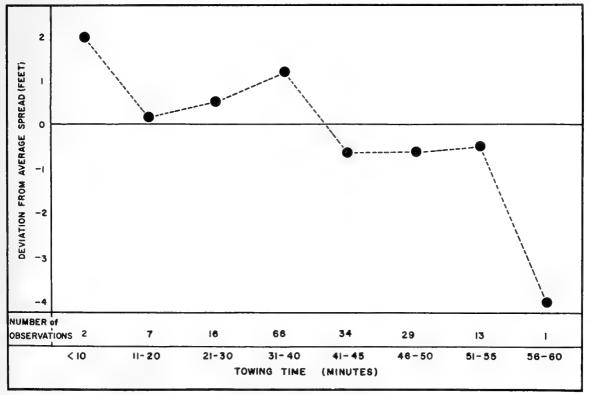


Fig. 7 - The average of deviations from the average within-tow spread at specific time intervals.

operation and illustrates the value of a more complete understanding of the factors which determine the spread of the trawl doors. The following discussion is based largely on observations and a synthesis of ideas resulting from a survey of pertinent literature.

Since the most pronounced change in spread was found to be associated with the depth-scope ratio, it is appropriate to examine the relationship between the warp length and the shape or configuration of the warp. Pode (1951) points out that the equilibrium configuration (in a vertical plane) of a flexible cable in a stream is dependent on three factors:

- 1. The hydrodynamic force that arises from the water flow (vessel speed).
- 2. The weight of the element of cable in the water (length of cable out).
- 3. The tensions in the cable at the ends of the element (pull of vessel and drag of the net and doors).

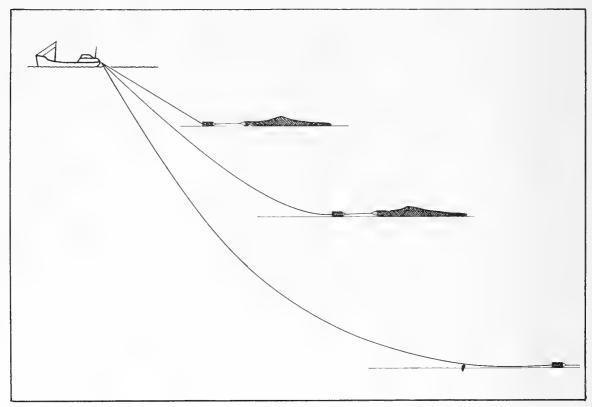


Fig. 8 - Hypothetical trawl warp configuration--projected to a vertical plane--in various water depths using a constant scope ratio.

In trawling, when depth is increased and the scope ratio, vessel speed, and terminal tensions remain approximately the same, the only factor affected is cable weight. With more cable out, and without a compensating increase of speed and terminal tensions, the downward force of gravity in relation to the hydrodynamic lift becomes greater. The result is a change in the equilibrium configuration or shape of the cable (fig. 8). As viewed in a vertical plane, when the water depth is increased but the scope ratio is held unchanged, the direction of pull by the cable at the trawl door theoretically changes from an upward to a horizontal direction. This is in agreement with results of studies of trawl warp configuration by Kullinberg

(1951) and Kobayashi and Takashashi (1951 a and b). The theoretical change in the lateral configuration of the warp with increased depth (scope ratio unchanged) is shown in figure 9. The direction of pull on the door by the warp in shallow water is apparently forward, and with increasing depth, tends to become progressively inward, toward the mid-line. Similar changes of configuration or shape of a warp may be obtained by either increasing depth, using a constant scope ratio, or increasing scope ratio in a constant water depth.

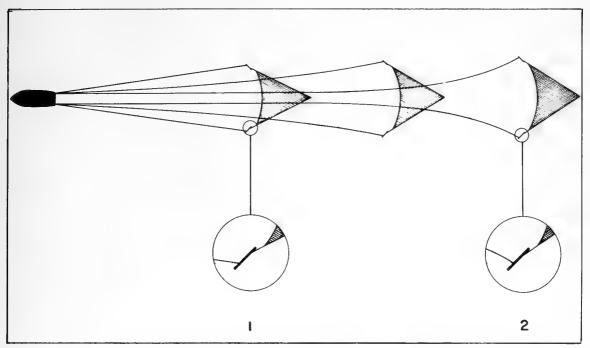


Fig. 9 - Hypothetical trawl warp configuration--projected to a horizontal plane--in various water depths using a constant scope ratio in (1) shallow water, (2) deep water.

The effect on the performance of the trawl door produced by these various directions of pull of the warp is indicated by the work of DeBoer (ibid). In addition to observing instrumental evidence of increased door spread with increased scope ratio (in a constant depth), he found that the longitudinal tilt of the door, as recorded by his instruments, was from forward to aft; the lateral tilt, from out to in; and the angle of attack, from large to small. Figure 10 shows the above effects. In figure 10(1) the door is tilted out and foreward. The door shown in figure 10(2) is laterally and longitudinally square, and in figure 10(3) the door is tilted in and backward. The warp is pulling upward, forward, and downward in figures 10(1), 10(2), and 10(3), respectively.

The resultant effect of the mentioned factors on door spread will vary with water depth and towing speed. In shallow water, using a small scope ratio, the warp is apparently pulling up and forward. This would tend to pull the door off the bottom resulting (because of its construction and the direction and magnitude of the forces affecting it) in a tilting of the door outward and forward. Since the lateral pull is probably minimal in this situation, the angle of attack will be large. The forward tilt, however, reduces the contact with the bottom and, therefore, the shearing effect, resulting in reduced spread. Using the same scope ratio in deeper water, the warp apparently pulls forward and in, resulting in a minimum tilt in both directions and a smaller angle of attack. Since contact with the bottom is better, the shearing effect is increased. Although in this instance the angle of attack is smaller, the spread is greater. DeBoer (ibid) found that with a greater increase in scope ratio (analagous to a further increase in depth using the same scope ratio) the door tilt

became slightly aft (tilt 0.5°) and in; and although the angle of attack decreased further, the spread of the doors continued to increase. This is probably because the warp was pulling down (in a vertical plane) since it was on or near the bottom ahead of the door, and tended to force the door into the bottom. Although slightly tilted, the contact of the door with the bottom would be better than in the previous instances, and therefore, the shearing effect and the spread would be greater.

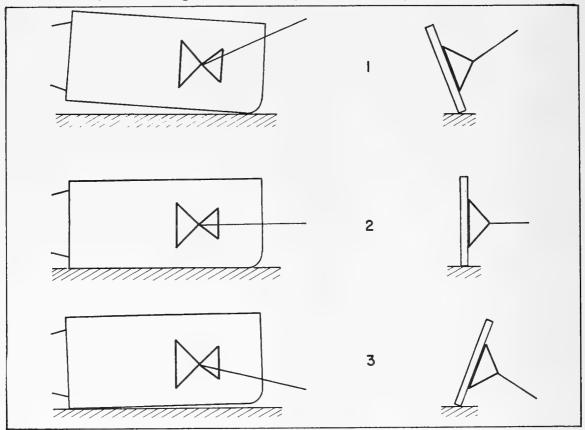


Fig. 10 - Hypothetical longitudinal (left) and lateral tilt of the trawl door using a small scope ratio, progressing from shallow water (1) to deep water (3).

The effect of vessel speed on door spread is similarly related to the change of equilibrium configuration of the cable. In this instance the hydrodynamic force, which is increased when speed is increased, results in a greater lift on the warp. The warp is, therefore, pulled away from the horizontal, resulting in a more upward pull on the doors and consequently a decreased spread. This effect is more pronounced in shallow water (when using a small scope ratio) because the warp is initially pulling upward, and the greater speed increases the upward pull, reducing the bottom contact and, consequently, the spread. In deeper water, with the same scope ratio, an equivalent speed increase will also alter the shape of the cable. The effect on the warp at the trawl door, however, is much less and it lies within a range that will not produce significant changes in the position of the door.

The foregoing observations and considerations indicate that the spread of a trawl is determined principally by the degree of contact between the doors and the bottom. Considering the number and variability of the factors which influence door spread, it is apparent that obtaining consistent optimum spread is extremely complex. Development of doors that will produce optimum contact with the bottom within a wide range of scope ratios and speeds, or that will produce maximum spread independent of bottom contact, could be rewarding.

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WHAT ATTRACTS FISH?

The sense of smell plays a fairly important part in the lives of all fish, but it is not the only sense upon which they rely to obtain food. They rely also upon the organs of sight and hearing; however, if these should fail, they could probably locate food by smell alone.

In some fish the sense of smell is extremely acute. The smell of blood or of decaying fish, for instance, attracts sharks from great distances. The extent to which the sense of smell is employed for locating food varies not only with the species of fish but also with circumstances.

The U.S. Bureau of Commercial Fisheries has conducted some research on the effects of sound on fish and from that work it is felt that except for the initial "start" when sound is first perceived, there is little effect either as an attracting force or as a repelling one.

In summary, it appears from research done on stimuli which attract fish that the sense of sight is probably the most important sense to the fish in terms of recognizing danger, food, etc. Consequently, it would seem that attractants designed to stimulate the sense of sight would be the most effective. This applies to fish in both fresh-water and the marine environments.



POSSIBLE ATOMIC ENERGY COMMISSION ASSISTANCE OF RESEARCH ON RADIATION PRESERVATION OF FISH

The Ad Hoc Committee to the Interdepartmental Committee on the Radiation Preservation of Foods has recommended that Federal agencies, in line with the President's Atoms for Peace Program, sponsor further research into the preservation of foods through radiation. As a result of this recommendation, representatives of the U. S. Bureau of Commercial Fisheries were invited to discuss with Atomic Energy Commission (AEC) representatives the potential of fishery products as a food on which intensive research might profitably be conducted. The unique needs of the fresh fish trade for an improved method of preservation, such as radiation preservation, as well as the very encouraging findings of the Bureau in this field, were outlined.

On the basis of the discussion, the AEC is prepared to concentrate its efforts in radiation preservation research on the products of the fishing industry. There is in preparation a research program and justification for presentation to Congress. The Chief of AEC's Office of Isotopes Development has indicated that it may be possible to supply one of the Bureau's technological laboratories with a mobile reactor suitable for fisheries research. He also expressed some interest in the possible use of isotopes as a tracer to evaluate the extent of water pollution in the effluent of various industrial plants.

OPTIMUM LEVEL OF MENHADEN FISH MEAL AND SOLUBLES AS SOURCES OF GROWTH FACTORS IN BROILER DIETS

In broiler feeding experiment No. 13 conducted at the University of Delaware, rather conclusive evidence was obtained as to responses obtained from fish meal and condensed fish solubles in a corn-soy diet not supplemented with methionine. This experiment was part of a study conducted under a contract between the University of Delaware and the Bureau of Commercial Fisheries financed with funds derived from the Saltonstall-Kennedy Act (Public Law 466, 83rd Congress, 1954).

In this test, selected day-old White Rock cockerels were allotted randomly to 20 groups of 50 chicks each and were housed in floor pens at the poultry farm at the University of Delaware. The weight of each chick and the feed consumed by each group of chicks were determined at the end of eight weeks.

All diets fed to the various groups of chicks were prepared from a constant amount of basal mash consisting of ground yellow corn, soybean meal, corn gluten meal, alfalfa meal, vitamin premix, salt, and a trace mineral mix. This mash was the base of the experimental diets to which were added varying levels by weight, of menhaden fish meal or menhaden fish meal and condensed fish solubles. Each varying level of fishery product added, however, was done so in duplicate to permit

formulation of paired diets containing the same levels of fish meal or fish meal and solubles, but containing different levels of total protein. The diets then were individually balanced with corn meal, soybean meal, fat and bone meal to formulate comparable diets, containing either 22 percent total protein or 26 percent total protein and 1,050 calories of productive energy per pound. No supplementary methionine was added to these diets. Actual chemical analyses were conducted on a random selection of three of the diets containing 22 percent protein and three of the diets containing 26 percent protein. Results indicated that the calculated analyses of the diets were accurate.

The moisture, protein, fat and ash contents were 7.0, 62.6, 12.6, and 16.0 percent, respectively, for the commercial sample of menhaden meal used in this test. The fish meal had been treated with the antioxidant butylated-hydroxy-toluene (BHT). The moisture, protein, fat and ash contents were 49.8, 33.8, 8.7, and 8.0 percent, respectively, for the commercial samples of condensed menhaden solubles used in this test. Values of 1,030 and 612 calories of productive energy per pound for the menhaden meal and solubles, respectively, were utilized in formulating the various diets containing the fishery products.

In each experimental series there was a control diet that contained no added fish meal or solubles and three diets that contained only fish meal--one each at a level of 2.5, 5.0, and 7.5 percent by weight. The six remaining diets in each series contained the fish meal and solubles in combination. Three of these diets contained a level of 2.5 percent fish solubles by weight--one each with 2.5, 5.0, and 7.5 percent fish meal. And three of these diets contained a level of 5.0 percent fish solubles by weight--one each with 2.5, 5.0, and 7.5 percent fish meal.

- 1. In the 22-percent protein diet, all levels of fish meal gave a significant improvement.
- 2. The condensed fish solubles gave a response which was additive over the fish meal.
- 3. The 26-percent protein <u>basal</u> ration gave much better growth than the 22-percent <u>basal</u> ration. However, the 22-percent ration with 5-percent fish meal and 4.8-percent fat gave equal growth and better feed conversion than the 26-percent basal with 8-percent fat. The responses from fish meal and condensed fish solubles were not as great on the 26-percent diet as the 22-percent diet insofar as growth was concerned, but they did show improvements in feed conversion.

We believe that these data present definite results of importance in the practical use of fish meal and condensed fish solubles. Fish meal has its greatest value in the lower protein ration. This is entirely logical because quality of protein or the best supply of essential amino acids becomes most important in the lower protein ration. As the level of protein is increased, the need for more fat to keep the diets iso-caloric is demonstrated; and, fat costs as much or more than fish meal depending upon geographic location.

To say the above in another manner, it is obvious that when all the essential amino acids are supplied at the lowest possible level of protein, it is possible to use more corn as an economical source of energy. In formulating feeds on this basis, synthetic methionine must be given consideration too. In fact, we believe that it makes an economic contribution where fish meal is used in the corn-soy basal diet.

It must be constantly kept in mind that the economic contribution fish meal makes must be judged on the basis of its over-all values as shown by comparison with the New England College Conference ration, where methionine is added, and a substitute formula without fish meal.

On the basis of costs at Lancaster, Penn., the 22-percent ration with 5-percent fish meal, and the 22-percent ration with 5-percent fish meal and $2\frac{1}{2}$ -percent condensed fish solubles, cost less than the 26-percent ration without fish products which gave significantly poorer growth and feed conversion. This difference will, of course, vary in different sections of the country.

Our present research problem is to develop calorie to amino acid requirements and not be satisfied with calorie to protein requirements. Our leading investigators in poultry nutrition have emphasized this fact.

SUPPLEMENTARY EFFECT OF FISH MEAL AND FISH SOLUBLES IN CHICK DIETS

Rather extensive research with chicks fed commercially-practical broiler diets in batteries has failed to indicate at this time that commercial variables in processing will affect the uniform value of fish products.

When condensed menhaden fish solubles were superimposed upon menhaden fish meal in experimental treatments, their chick-growth promoting effect was additive.

Five percent fish meal and 2.5 percent condensed fish solubles in combination were found to be a practical level of fish products for the study of their chick-growth promoting properties.

A 26-percent protein unsupplemented corn-soy-fat chick diet produced superior growth to a 22-percent unsupplemented protein diet equated for energy. When these diets were supplemented with a combination of 5-percent fish meal and 2.5-percent fish solubles, the results from both diets were improved, but the lower protein diet was improved to a greater extent making the two different protein levels comparable. This is interpreted to be due to improved amino acid balance.

Preliminary findings indicate that results from battery experiments with fish products may not be applicable to floor pen studies under commercial conditions.

This information on the biological value of fish meal using practical chick-type rations was revealed by a study conducted under a contract awarded the University of Delaware by the U. S. Bureau of Fisheries and financed by funds derived from the Saltonstall-Kennedy Act (Public Law 466, 83rd Congress, 1954).

The findings included information on the following:

- 1. The effect of processing variables on the feeding value of fish meals.
- 2. The additive effect of fish meal and fish solubles on chick growth.
- 3. Practical feeding levels of fish meal and fish solubles.
- 4. The effect of amino acid balance upon dietary protein level.
- 5. The value of fish meal fed to chicks in floor pens versus battery brooders.



FISH MEAL AS A SOURCE OF UNKNOWN GROWTH FACTOR AND HIGH-QUALITY PROTEIN

During 1955 and 1956 more than 20 samples of commercial and experimental fish meals were assayed for unknown growth factors. A standard sample of fish solubles was fed at several levels in each assay. It was assigned a potency of 10. The comparative potencies of the fish meal samples ranged from 2.5 to 13.8. The values for 8 commercial menhaden meals were 13.8, 11.8, 9.5, 5.4, 5.3, 3.0, 2.7, and 2.7. Attempts to relate this variation to known differences in origin, processing, or storage of the meals were unsuccessful.

Experiments involving controlled processing and storage indicated that the unknown growth factor is quite stable. Two samples of menhaden meal were assayed immediately after processing and after storage periods of different lengths under different conditions. Storage in air at room temperature for 18 months did not reduce the growth-factor potency. The potency was not reduced by excessive heat during processing, such as a 3-hour cooking period or a 3-hour drying period at 390° F.

Lest the variation in growth factor potency of fish meals be overemphasized, it should be clearly stated that all of the samples, both commercial and experimental, contained measurable quantities of growth factor.

Experiments on protein quality of fish meals showed that this characteristic was much more easily affected by improper processing than was growth-factor potency. (In these studies, extreme processing conditions were deliberately used in the preparation of the samples.)

This research was financed by funds made available by the Saltonstall-Kennedy Act of 1954 and a contract between the Bureau of Commercial Fisheries and the University of Wisconsin.

FEED FORMULATION UTILIZING A HIGH-SPEED DIGITAL COMPUTER

A high-speed digital computer was used to arrive at detailed and general considerations of least-cost feed formulation.

Since feed manufacturing has become a highly scientific and automated industry, and because many of these new feeds contain a great number of ingredients which provide essential nutrients and must be given proper weighting, new opportunities have developed for high-speed calculations.

Most major ingredients have definite nutritional components and supply varying amounts of essential nutrients. Each ingredient also has a definite cost at any specific time and these costs vary substantially from month to month and from one area to another. Digital computers have made possible the rapid calculation of least-cost formulas through the application of linear programming techniques which, when properly applied, can be of great assistance to the nutritionist both in the determination of least-cost feeds and as a check on the analyses of complex combinations of ingredients.

What is the most practical type of a ration today? In the main we shall refer to broiler, chick or turkey starter rations because we have the most data on these feeds. In most areas corn and soybean oil meal form the basis of practical broiler, chick and turkey starters; hence, we will proceed on this basis.

Pounds 100

These two basic ingredients, corn and soybean oil meal, are supplemented by proper additions of known vitamins, minerals, fat for energy, and drugs that have been proven to assist in the control of disease or to stimulate growth.

The New England College Conference Broiler Starter is typical of a highly efficient broiler ration which meets the generally accepted standards for a top quality ration.

On the basis of what we know about nutritional requirements of chicks, if one leaves out the fish meal used in the New England College Conference Broiler Starter, substitutions would be required, but the two rations would have the same approximate nutritional content.

Analyses of the rations show the following differences in ingredients:

Fish meal per ton of feed.

phosphorus ratio.

REMOVAL OF

$\frac{129}{229}$	Ground yellow corn per ton of feed to make room for other necessary additions.
	(From the New England College Conference Broiler Starter)
	ADDITION TO THE SUBSTITUTE RATION OF:
Pounds	
120 40 13.6	Soybean oil meal per ton of feed to equalize protein. Condensed fish solubles per ton of feed to furnish the fish factor. Dicalcium phosphate per ton of feed to furnish the same level of available phosphorus.
50	Fat per ton of feed to equalize the rations in productive energy.

4.4 Calcium carbonate per ton of feed to maintain the same calcium to

Methionine per ton of feed to equalize the rations in methionine.

Based on the market of June 8, 1959, costs, f.o.b. Philadelphia or Baltimore, were as follows:

Pounds		Per Ton	
$\frac{100}{129}$	Fish meal Ground yellow corn	@ \$133.00 = 54.00 =	$\begin{array}{r} \$ & 6.65 \\ \hline 3.48 \\ \hline \$10.13 \end{array}$
Pounds		Per Ton	
120 40 13.6 50 4.4 1 229	50-percent soybean oil meal Condensed fish solubles Dicalcium phosphate Fat Calcium carbonate Methionine	@ \$ 73.50 = 80.00 = 95.00 = 140.00 = 7.60 = 3,100.00 =	\$ 4.41 1.60 0.65 3.50 0.02 1.55 \$11.73

The replacement costs of fish meal can be calculated readily in any area. The comparative values cited apply only on this basis of market values at Lancaster, Penn. Calculations in other areas should be made on actual ingredient costs.

Many products have been offered for sale as substitutes for fish meal that actually were only supposed to contain the unknown growth factor (or factors) in fish meal. One can replace fish meal only by restoring all of the nutritive values that the meal normally supplies.

GAS CHROMATOGRAPHIC STUDIES OF FISH SPOILAGE

Work is in progress to study the chemical nature of fish spoilage with the possible development of an objective index of fish quality or of a means of retarding fish spoilage.

The Bureau's Seattle Fishery Technological Laboratory recently completed the first extensive use of the new technique of gas chromatography to determine volatile acids in fish extracts. They are studying the formation of volatile organic acids during deterioration of fish meat. Acetic and formic acids were the only acids found while the fish were organoleptically acceptable. The sequence of formation of individual acids in fish incubated at 34° F., 40° F., and 70° F. was essentially the same except that propionic acid increased at a greater rate than other acids in the fish incubated at 70° F.

	Composition of S	Some Fish	ery Produc	ts <u>1</u> /	
Fish	Form	Portion	Calories	Percentage of Protein	Percentage of Fat
Bluefish }	baked fried	4 oz. 5.3 oz.	193 307	34 34	.5 15
Clams }	raw canned	4 oz. 3 oz	92 44	$\begin{array}{c} 14.5 \\ 6.7 \end{array}$	1.6 0.9
Haddock	fried	4 oz.	166	22.5	6.3
Halibut	broiled	4 oz.	207	29.8	9
Mackerel, Pacific	canned	3 oz.	153	17.9	8.5
Oysters	raw	1 cup	200	23.5	5.0
Salmon	broiled	1 steak	204	33.6	6.7
king	canned	3 oz.	173	16.8	11.2
chum	canned	3 oz.	118	18.3	4.4
silver	canned	3 oz.	140	17.9	7.1
pink	canned	3 oz.	122	17.4	5.3
red	canned	3 oz.	147	17.2	8.2
Sardines, Atlantic		3 oz.	288	17.9	23
Sardines, Pacific	canned, natural	3 oz.	171	15.1	11.5
	canned, tom, sauce	3 oz.	184	15.1	12.6
Shrimp	canned, drained	3 oz.	108	22.8	1.2
Swordfish	broiled	1 steak	223	34.2	8.5
Tuna }	canned, oil drained	3 oz.	169	24.7	7.0
}	canned, not drained		247	20.2	17.8
1/ Data obtained from US	DA Handbook No. 8 Composi	tion of Foods.			



Atomic Waste

ISSUANCE OF DISPOSAL LICENSE TO MILITARY SEA TRANSPORTATION SERVICE PROPOSED:

The Atomic Energy Commission has given notice of proposed issuance of a license to the Department of the Navy, Military Sea Transportation Service (MSTS), Washington, D. C., for disposal of low-level radioactive wastes in the Atlantic and Pacific Oceans at a minimum depth of 6,000 feet (1,000 fathoms).

Notice of the proposed license issuance was filed with the Federal Register on August 10, 1959. The license was due to be issued by August 25, 1959, unless a request for a formal hearing was filed with the Commission.

Disposal operations by MSTS would be limited to the handling of waste materials generated in Federal Government laboratories and installations, including those operated by Commission contractors, authorized by the Commission to package waste for sea disposal. MSTS would act as a carrier for the waste material only from the dock to the sea-disposal location.

The types of waste to be handled are low in radioactivity, and generally consist of residual solutions from experiments, contaminated paper, cloth, glassware and equipment, animal carcasses, and sealed sources of radioactivity which have been reduced to unusable levels by the natural process of radioactive decay.

The sea-disposal containers used and the disposal sites would meet the recommendations of the National Committee on Radiation Protection for disposal of radioactive wastes in the oceans. The proposed license specifies three Atlantic and two Pacific disposal sites, all designated heretofore as waste disposal areas. All proposed disposal sites have minimum depths of 6,000 feet (1,000 fathoms).

The approximate locations of the Atlantic sites are: (1) 200 miles due east of Cape Cod, Mass., (2) 105 miles east southeast of Cape Henry, Va., and (3) 120 miles southeast of Sandy Hook, N. J.

The approximate locations of the Pacific sites are: (1) 185 miles west southwest of Los Angeles, and (2) 115 miles due west of San Francisco.

* * * * *

OCEANIC DISPOSAL OF ATOMIC WASTE STUDIED BY COAST AND GEODETIC SURVEY:

Skin-diving oceanographers of the Coast and Geodetic Survey, U. S. Department of Commerce, have completed monitoring of simulated packages of "radioactive waste," dumped into 97 feet of water off the New England coast. This unique oceanographic operation was carried on under contract with the Atomic Energy Commission.

Instead of real atomic materials, the packages contained a brilliant yellow fluorescein dye. The Atomic Energy Commission wanted to know whether such containers break open immediately, gradually disintegrate, or are buried in the bottom.

The Coast and Geodetic Survey reports that the skin divers went overboard from the fantail of the survey vessel Gilbert and stationed themselves at the bottom as the dye-containing packages were dropped from the vessel. The containers

were numbered for identification. These metal drums, weighing up to 1,200 pounds, were packed variously and dropped under varying current conditions. Those solidly-packed with concrete seemed to resist breakage and settle on the bottom.

Slight current did not affect appreciably the downward trek of the "cans;" some moving on a deflected or spiral course. The divers, waiting on the bottom, had to be careful. Underwater "dust" created by the successive bombardment of "cans" limited vision to a few feet at times.

The diving operations were carried on over Browns Ledge, which is twelve miles west from Martha's Vineyard, Mass. The team of four was accompanied by a diving scientist from the U.S. Bureau of Commercial Fisheries.

The Browns Ledge studies are part of a larger project planned to find out what happens to radioactive waste dropped into the sea, so that the best disposal areas and methods can be determined.

Other data were gathered in a disposal area about 20 miles off Boston harbor, where wastes of low radioactivity and obsolete ammunition have been dumped in the past. The depth is about 300 feet. No diving was done here, and the equipment used was tested with a counter for radioactivity when it was pulled aboard. No activity was found.

The direction and speed of the currents at three depths were taken every half hour for 100 hours with meters lowered at points a couple of miles apart. Every hour during the same period, a record was made with a bathythermograph of temperatures at all depths.

Water temperatures were measured as the survey started and ended, all the way from Boston harbor entrance to a point beyond the disposal area.

Many samples of bottom sediment and sea water were gathered for analysis by the U. S. Public Health Service. At Browns Ledge special current and temperature records were made.

Analysis of the water, together with studies of bottom and marine life, made

by the Public Health Service, are expected to show the extent of absorption of radioactivity. The current data will help to determine where the materials have been carried.

In some new area where dumping is started, it is planned that the Coast and Geodetic Survey will increase its program of sampling the bottom-dwelling organisms. Many marine animals can concentrate trace elements and may prove to be good indicators of radioactive concentration when examined by bio-radiologists of other Government or private agencies.

According to a news release by the National Academy of Sciences on June 21, 1959, a number of other areas are under consideration for studies comparable to those just completed at Browns Ledge. Twenty-seven such sites were listed for possible use for controlled disposal of packaged low-level radio-active wastes. The techniques used by the Coast and Geodetic Survey, especially with diving oceanographers, provide promise as an effective monitoring measure.

The Coast and Geodetic Survey made a preliminary survey on Georges Bank last summer to test the feasibility of observations and sample collections by diving oceanographers and of measuring bottom currents from anchored buoys.



California

AERIAL CENSUS OF ABALONE SPORT FISHING CONTINUED:

Airplane Spotting Flight 59-12-Abalone: The shore line from Ano Nuevo to Ft. Ross was surveyed from the air (June 22, 1959) by the California Department of Fish and Game Cessna 180 to estimate numbers of abalone sport fishermen and relative intensity of fishing during a very low minus tide on a week day for comparison with similar conditions on a weekend.

Flight conditions were favorable for observation although surf conditions were not as good for the fishermen as on previous dates. In general, fewer fishermen were on the beaches during this period than were observed approximately one month previously when tidal conditions were similar on a weekend. As noted on previous flights, it was not always possible to tell exactly what the fishermen were doing, whether collecting clams and abalone, or just looking. At some locations their purpose was obvious and they could be readily classified as to the type of fishing activity.

Note: Also see Commercial Fisheries Review, September 1959, p. 20.

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BIOLOGISTS PREDICT TIME AND PLACE OF ALBACORE TUNA RUN FOR THIRD YEAR:

For the third consecutive year California fishery biologists have predicted the time and place where the first albacore run of the year would appear off the California coast. The prediction made in May on the basis of ocean water temperature patterns and currents existing in April, came true at noon on June 5.

Tagging studies and log books kept by commercial fishermen were two of the keys which the biologists used to unlock the secret of the albacore's migrations.

Tag returns disclosed they are the widest ranging nomads of the Pacific Ocean, some making round trips to Japan from California. Log records, and other studies, revealed they are present off California when the run is on in a very narrow range of ocean temperatures—60° to 70° F.—from which they rarely stray.

The first school was spotted 85 miles northwest of Point Arguello, Santa Barbara County, by the California Department of Fish and Game research vessel N. B. Scofield. It had departed Terminal Island on a predetermined course June 1 and found the school just as predicted.

The commercial fishing fleet was notified by radio and immediately thereafter boats from Morro Bay and San Pedro set sail to fish for albacore. The initial run was scattered over a tremendous ocean area.

In previous years, the earliest run of albacore approached California from the general direction of northern Mexico. However, warm water conditions, which have prevailed for the last two years, have apparently pushed the runs much farther north. (Outdoor California, July 1959.)

Canned Fish

CONSUMER PURCHASES, JUNE 1959:

Canned tuna purchases by household consumers in June 1959, were 964,000 cases of which 54,000 cases were imported. By type of pack, domestic-pack-

ed tuna purchases were 228,000 cases solid, 589,000 cases chunk, and 93,000 cases grated or flakes. The average

purchase was 1.9 cans at a time. About 31.2 percent of the households bought all types of canned tuna; only 2.1 percent bought the imported product. The average retail price paid for a 7-oz. can of domestic solid or fancy was 34.9 cents and for a $6\frac{1}{2}$ -oz. can of chunk 28.2 cents. Imported solid or fancy was bought at 29.6 cents a can. June purchases were slightly higher than the 919,000 cases bought in May by 4.9 percent; retail prices in most cases were slightly lower.

During June, household consumer purchases of California sardines were 41,000 cases; and 38,000 cases imported sardines. The average purchase was 1.7 cans at a time for California sardines and 2.1 cans for imported. Only 1.7 percent of the households bought canned California sardines and 2.2 percent imported. The average retail price paid for a 1-lb. can of California sardines was 23.1 cents and for a 4-oz. can of imported 24.9 cents. Retail prices were slightly lower for both California and imported canned sardines. Because of the liberal stocks of canned California sardines, there has been a steady increase in purchases since October 1958.

Canned salmon purchases in June 1959 were 225,000 standard cases, of which 114,000 cases were pinks and 54,000 cases

reds. The average purchase was 1.2 cans at a time. About 15.3 percent of the households bought all types of canned salmon; 7.8 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 56.7 cents and for red 86.8 cents. June purchases were up about 0.9 percent from the 223,000 cases bought in May.



Cans--Shipments for Fishery Products, January-June 1959



Total shipments of metal cans for fishery products during January-June 1959 amounted to 53,800 short tons of steel (based on the amount of

steel consumed in the manufacture of cans) as compared with 47,212 tons in the same period a year ago. Canning of fishery products in January-June this year included tuna, Maine sardines, salmon, and shrimp. Shipments of metal cans were lower by 17.6 percent from May to June this year, but higher by 14.5 percent from June 1958 to this June.

During the first six months of 1959 the total shipments of 53,800 tons included 39,508 tons or 73.5 percent shipped to the West Coast area, 12,019 tons or 22.3 percent to the East Coast area, and 2,273 tons or 4.2 percent to the Central area (includes Gulf States).

Continued heavy canning of tuna on the West Coast and a large pack of canned shrimp are principally responsible for the greater use of cans the first half of this year as compared with the first half of last year.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 33.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries

Investigations $\frac{1}{2}$

RELATIONSHIP FOUND BETWEEN SEA SURFACE TEMPERATURE AND SKIPJACK TUNA ABUNDANCE:

A curve showing the rate of change of sea surface temperature at the U.S. Bureau of Commercial Fisheries Honolulu Biological Laboratory's Oahu monitoring station exhibited features similar to those found on the curve for 1954, a year during which 14 million pounds of skipjack were landed--one of the best years on record. Further, it was reported that the temporal variation of a feature of these curves (the date when the monthly rate of change of sea surface temperature is zero) had a predictive value, and as this 'index' occurred early in 1959, an average or better-than-average Hawaiian skipjack season was predicted. Had the index occurred in the spring (say in March rather than early February), a poor fishing season would have been predicted.

By the end of July the prediction made before the onset of the season was borne out. The landings at the Honolulu cannery during May, June, and July were 1,618,784; 1,560,752; and 2,329,423 pounds. Average landings for those months were 1,026,332; 1,713,269; and 1,940,492 pounds. Landings for 1958 (a poor season) for those months were 168,021; 946,953; and 1,263,489 pounds.

The studies of skipjack behavior were continued in July. The abundance of schools in Hawaiian waters during July provided opportunities for visual and photographic studies aboard the Bureau's research vessel Charles H. Gilbert from the new hull-mounted observation chamber and for comparison of the studies from the chamber with closed-circuit television. Two types of TV were tested; neither was found to be an improvement over observations made from the hull-mounted chamber.

Various types of behavior studies were made; for example, iao (silversides) was compared with nehu (an anchovy) as live bait. When nehu was

1/Research conducted by the Bureau's Honolulu Biological Laboratory is now listed under this heading instead of "Pacific Oceanic Fisheries Investigations." thrown as chum, large skipjack (25-30 pounds) would move comparatively slowly and along straight paths while the smaller tuna (4-10 pounds) would move quickly and erratically. When iao were used as chum, the actions of the larger skipjack were similar to those of the small fish when chummed with nehu.

The effects of live and dead nehu were also examined. The skipjack schools would immediately leave the boat when dead nehu were used, but a mixture of live and dead bait could be used to a limited extent.

A form of silvery "tinsel glitter" was investigated as a possible bait enhancer. The skipjack, viewed through the ports of the observation chamber, would move toward the glittering particles and then begin feeding upon nehu which were thrown in the water at the same time. Although attracted to a mixture of glitter and live nehu, the tuna were not interested in glitter and dead nehu; in fact they appeared to be repelled by the dead fish.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PUR-CHASES, JANUARY-JULY 1959:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, almost 2.3 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in July 1959 by the Military Subsistence Supply Agency field headquarters. On the basis of quantity, this was 2.7 percent more than the amount purchased the previous month, but 23.9 percent less than the purchases in July 1958. The value of the purchases in July 1959 were 2.8 percent higher than in June, but 33.5 percent less than in the same month of last year.

Table		resh and filitary S July 19		ice Sup	ply Ag		ased				
QUANTITY VALUE											
Jul	У	Jan.	-July	July JanJuly							
1959	1958	1959	1958	1959	1958	1959	1958				
		00 Lbs.)			(\$1,C						
2.2721	12.984	113, 618	114.579	1.203	1.809	7,190	8,409				

For the first seven months of 1959 purchases totaled 13.6 million pounds, valued at \$7.2 million--a decrease of 6.6 percent in quantity and 14.5 percent in value as compared with the purchases for the same period of 1958.

Canned Fishery Products: Tuna and sardines continued to be the principal canned fishery products purchased for the use of the Armed Forces during July 1959. This year through July substantially more tuna and sardines were purchased, and only a very small amount of salmon.

Tab	Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, July 1959 with Comparisons													
QUANTITY VALUE														
Product		lly		-July		ıly		-July						
	1959	1958	1959	1958	1959	1958	1959	1958						
		(1,000	Lbs.)			(\$1,	000) .							
Tuna	150	779	1,982	2,562	70.0	398.0	938.0	1,288.0						
Salmon	1	-	13	1,400	0.5	-	9.5	768.0						
Sardine	107	10	776	52	16.0	4.0	116.0	19.0						

Note: Armed Forces installations generally make some local purchases not included in data given; actual total purchases are higher because it is not possible to obtain local purchases.

* * * * *

MILITARY SUBSISTENCE MARKET CENTERS CHANGE TITLES:

The Military Subsistence Market Centers were redesignated Headquarters, Military Subsistence Supply Agency, effective July 15, 1959. Also, the Field Offices were redesignated either Supply Offices or Purchasing Offices. This change does not affect the responsibilities of the offices involved.



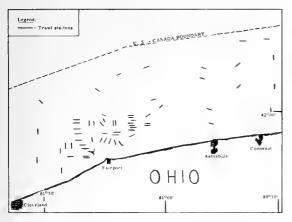
Great Lakes Exploratory Fishing and Gear Research Program

EXPERIMENTAL SMELT FISHING

IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 3: Commercial quantities of smelt were taken in trawling operations in South Central Lake Erie during an 18-day cruise of the U.S. Bureau of Commercial Fisheries chartered vessel Active, completed July 23, 1959. Echo-sounding and exploratory-fishing operations were conducted between Cleveland and Conneaut, Ohio, to obtain additional information on the seasonal distribution of smelt and other fish stocks.

A total of 66 tows was completed in the area using a 50-foot two-seam balloon trawl with $2\frac{1}{4}$ -inch mesh and a $1\frac{1}{2}$ -inch mesh bag. More than 30 tows were made within a 10-mile radius of Fairport Harbor, Ohio. The smelt were found, as in the previous cruise, generally concentrated in waters deeper than 7 fathoms. Tows made on echo-sounder



M/V Active Cruise 3 (July 6-23, 1959).

indications produced catches up to 500 pounds of smelt an hour and smaller mixed catches of yellow perch, sheepshead, and burbot. Best catch results were experienced during early morning and late afternoon hours when smelt were observed to be just off the bottom. Smelt were taken in three general sizes--12-18 per pound, 30-35 per pound, and 35-40 per pound. Large numbers of the smaller fish were observed escaping from the trawl as it surfaced.

During night-fishing operations smelt were observed to rise from the bottom into midwater regions and to return to the bottom at sunrise. Night operations with lights resulted in the attraction of large quantities of emerald shiners with only a few smelt appearing at the edge of the illuminated area. Small surface schools of fish off Fairport and Cleveland in daylight were also identified as emerald shiners. No seine sets were attempted.

Surface temperatures ranged from 69° F. to 76° F. Bottom temperatures ranged from 45° F. at 12 fathoms to 70° F. at 6 fathoms.

The M/V Active departed about August 3, 1959, on the fourth 15-day exploratory fishing and gear research cruise. The area of operations was to be between Conneaut, Ohio, and Buffalo, N. Y., with visits scheduled to the ports of Erie, Barcelona, and Dunkirk.

Note: Also see <u>Commercial Fisheries Review</u>, Jan. 1959, p. 33, Feb. 1959, p. 20, and June 1959, p. 36.



Great Lakes Fishery Investigations

SURVEY OF SOUTHEASTERN LAKE SUPERIOR CONTINUED:

M/V "Cisco" Cruise 3: Work during Cruise 3, between June 30-July 14, 1959, by the U. S. Bureau of Commercial Fisheries research vessel Cisco in the area of southeastern Lake Superior from Marquette, Mich., to Whitefish Bay duplicated efforts of Cruise 1 to reveal seasonal changes. Standard gangs of gill nets were set at 25, 50, 75, and 100 fathoms off Grand Marais, Mich.; at 25, 35, 50, and 70 fathoms in Whitefish Bay; at 35 fathoms in Munising Bay; and at 2-10 fathoms in the west channel to Munising Bay (south of Williams Island).



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

Chub catches in gill nets were generally light and did not differ much from those made during Cruise 1. The average number of chubs per lift was 117, disregarding the set at 25 fathoms off Grand Marais and the one in the west channel to Munising Bay, in which no chubs were taken. The largest number taken was 177 in Munising Bay, of which 169 were Leucichthys hoyi. This species and L. reighardi were the commonest chubs in all catches, except at 75 fathoms off Grand Marais, where L. kiyi was abundant and L. hoyi rare, and at 100 fathoms off Grand Marais, where 59 of the 73 chubs were L. kiyi. L. zenithicus and L. nigripinnis were uncommon at all locations. The spawning period of L. reighardi still had not ended as a few of those taken were ripe or nearly so.

Lake herring were scarce except for 26 large fish (a few near one pound) taken at 25 fathoms off Grand Marais. Seventeen lake trout were netted, none at a depth greater than 50 fathoms. Ten of the lake trout were marked with spaghetti tags and released. The nets set in Munising Bay produced

107 of the unusually slow-growing whitefish which inhabit the deeper water of the Bay. Other species in the gill nets were smelt (numerous in only the 25-fathom set in Whitefish Bay), 1 burbot, 184 round whitefish, 85 longnose suckers, 1 white sucker, 2 alewives, and 2 yellow perch. The last five species were caught only in the shallow set in the west channel to Munising Bay.

Trawls were towed at several depths between 10 and 20 fathoms in Shelter Bay, east of Grand Island and off Grand Marais, and at 50 and 75 fathoms off Marquette. No baby lake trout were taken, despite the fact that in the Shelter Bay area they were present in moderate numbers during the same season in 1953. Catches of slimy sculpins and ninespine sticklebacks in the shallow tows were considerably larger than during Cruise 1. Somewhat over 1,000 of the latter species were caught in a 10-minute tow at 10 fathoms off Grand Marais. Present in only small numbers in the shallow tows were yearling smelt, trout-perch, pygmy whitefish, and small unidentified coregonids. A 20-minute tow at 50 fathoms off Marquette produced 58 L. hoyi, 48 L. reighardi, 6 L. kiyi, 1 L. zenithicus, 1 lake herring, 65 deep-water sculpins, 25 slimy sculpins, and 7 ninespine sticklebacks. A 20-minute tow at 75 fathoms produced 31 L. kiyi and 2 deep-water sculpins.

Several unidentified fish fry were caught near the surface in half-meter plankton nets of large mesh (No. 32 grit gauze) in Batchawana Bay, Ontario, and in Shelter Bay. No fry, however, were caught in similar tows in several other areas.

Limnological data were collected at regular stations off Grand Marais (45 fathoms) and in Whitefish Bay (70 fathoms). At the beginning of the cruise homothermous water (about 4° C. or 39.2° F.) was present at distances greater than 5 miles offshore from Grand Marais. Considerable surface warming, however, had occurred since Cruise 1 in all other areas visited, and had extended to 18 miles offshore from Marquette by the end of the cruise. Surface water temperatures were mostly 12° C. to 14° C. (53.6° F.-57.2° F.). Extremes of 3.3° F. and 16.3° C. (38.0° F. and 61.4° F.) were encountered.

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WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 3, July 13-22, 1959: This cruise was devoted to studies of the midsummer distribution of the lake herring in western Lake Superior. Work was conducted southeast of Michigan Island, east of Outer Island, north of York Island, northeast of Two Harbors, Minn., west of Bear Island, northwest of Sand Island, and north of Rocky Island.

The research vessel <u>Cottus</u> of the Fisheries Research Board of Canada joined the <u>Siscowet</u> for five days during the cruise. Both vessels are equipped with fish-magnifying fathometers and large areas were scanned to locate concentrations of lake herring. The vessels operated together on parallel courses to determine the size of individual schools detected on the fathometers.

Fathometer observations suggested very small and scattered schools of lake herring at each location. The schools apparently were small as at no time did both vessels record the same schools even though the vessels were operating as close as 100 feet apart. Nearly all the lake herring observed on the fathometer were located between 5 and 15 fathoms below the surface in waters 20 to 35 fathoms deep.

Bull nets (gill nets 300 feet long and 20 feet deep) with mesh sizes of $2\frac{1}{2}$ and $2\frac{3}{8}$ —inch were set to capture lake herring. An oblique set of three bull nets made from the surface to the bottom at 160 feet southeast of Michigan Island took only 14 lake herring. Thirteen of these fish were taken in the portion of the net fishing from 0 to 70 feet. The surface temperature was $62.0^{\rm O}$ F.

An identical set made north of York Island took 30 lake herring, 26 of which were taken from 0 to 70 feet. Three specimens (2 males, 1 female) were ripe. Several others were gravid. The surface temperature was $64^{\rm O}$ F.

An oblique set of 5 bull nets was made from 0-120 feet on the north shore near Two Harbors, Minn. Lake herring (140 fish) were taken in this set, 135 of which were captured between 0 and 40 feet. Nearly 80 percent of these fish were females and several were nearly ripe. The surface temperature was $53^{\rm O}$ F.

A floating gang of 5 bull nets was drifted in an area north of Eagle and Sand Islands between the hours of 2100 and 0900. The nets were floated about 18 inches below the surface in water from 20 to 35 fathoms deep. During this operation one end of the gang was attached to the Cottus while the Siscowet cruised slowly around the nets scanning with the fish-magnifying fathometer. Several small schools of fish were recorded. Between 0100 and 0300 the Siscowet took 10-minute horizontal plankton tows with a Clark-Bumpus plankton sampler at 12 feet, 40 feet, and 120 feet. Plankton concentrations at 12 feet were extremely heavy; concentrations at 40 feet were considerably less and at 120 feet practically no planktons were captured. Plankton samples were collected by the same method the following day at 1100 with identical results. The floating gang had drifted about 1.5 miles and the catch consisted of 45 lake herring, 5 chubs (Leucichthys hoyi), 2 brown trout, and 1 rainbow trout. The stomachs from about 20 lake herring were examined and all were empty but one which contained several small moths (unidentified). The surface temperature was 67° F.

An oblique set was made in the area where bull nets were drifted a day earlier to cover the depths which were not fished by the floating gang. Five bull nets were set from 0 to the bottom at 120 feet. Lake herring (44 fish were taken, 38 of which were captured between 20 and 60 feet. Only 4 lake herring were taken between 0 and 20 feet, the area fished by the floating gang. Stomachs from all lake herring were examined and several contained plankton. Other species taken were 13 chubs (9 L. hoyi, 4 L. zenithicus), 1 lake trout, and 1 smelt. Water temperatures in this area varied from 69° F. on the surface, 44° F. at 75 feet, and 39° F. at 175

feet. It was again demonstrated that herring are not found in abundance in water with temperatures exceeding $50^{\rm O}$ F.

Four 15-minute trawl tows were made west of Bear Island at depths of 6, 7, 14, and 18 fathoms. Two tows at 6 and 7 fathoms took only 5 ninespine sticklebacks, 3 smelt, and 1 small lake herring. The tow at 14 fathoms captured 53 small (4- to 6-inch) lake herring, 20 smelt, 20 slimy muddlers, and 1 stickleback. The tow at 18 fathoms captured 46 smelt, 10 chubs (L. hoyi), 4 lake trout, and 18 slimy muddlers.

One 15-minute tow was made in 36 fathoms northwest of Sand Island. The catch consisted of 77 chubs (76 L. hoyi, 1 L. kiyi), 75 slimy muddlers, 25 spoonhead muddlers, and 1 lake trout.

Three 10-minute tows were made with a $\frac{1}{2}$ -meter (No. 32 grit mesh) plankton net on a shallow rocky shoal just north of Rocky Island. Mayfly larvae made up the bulk of the catch; no fish larvae were captured.

Surface temperatures varied from 69.2° F. northwest of Sand Island to 53.6° F. near Two Harbors, Minnesota, Bottom temperatures remained at about 40° F.

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WESTERN LAKE ERIE

was near East Harbor.

BIOLOGICAL RESEARCH CONTINUED:

M/V "George L." Cruise 5, July 1959: Intensive trawling with the M/V George L. and the auxiliary workboat Madtom continued during July to gather further information on the distribution, growth, and food of the yellow pike (walleye) and other young fish. Young-of-the-year yellow pike were found in abundance along the shoreline from Huron west to Toledo, and north to the mouth of the Detroit River. Most of the young yellow pike were found near shore in water 8-15 feet deep over a sand bottom. In late July, the young-of-the-year fish were about 5 inches long and had begun to move into deeper waters. The largest number of

Although young fish were common in Sandusky Bay, none were found in Maumee Bay. Young yellow pike were rarely taken by trawling near Pelee, North Hen, Kelleys, or the Bass Islands.

young yellow pike (75) taken in one 10-minute tow

Young fish most commonly taken with young yellow pike were yellow perch, white bass, and spottail shiners. These species also made up most of the food of the young yellow pike.

A study to determine the variations in catches of fish by trawls was undertaken. Tows were made at three stations of different depths in the morning, afternoon, and night for 3 consecutive days near East Harbor. Great variations in the catches of young fish were observed. On the first two days all young yellow pike and other species 1-year old or older were fin-clipped and returned to the water in an attempt to determine movement and rate of recapture in the area. Only a few of the hundreds of fin-clipped fish were recaptured.

A 6-inch muskellunge, the first of this species taken by our investigations, was taken by trawl near East Harbor.

Gulf of Mexico Gear Research Program

SHRIMP-TRAWL PERFORMANCE OBSERVED BY UNDERWATER TELEVISION:

M/V "George M. Bowers" Cruise 21:
To obtain underwater movies of the performance of various types of Gulf of Mexico shrimp trawls, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers on August 3, 1959, completed the second in a series of cruises. The observations and photographs were made by SCUBA divers from a diving sled towed by the vessel in the vicinity of Panama City, Fla.

A total of 5,100 feet of underwater motion pictures of shrimp-trawling gear was obtained during the cruise. Complete records of the performance of the various components of a 40-foot flat shrimp trawl were obtained. Comparisons were made of chain doors and bracket doors, various amounts of chain on the footrope, various headrope floatation devices, and various bridle lengths at varying vessel speeds.

A 40-foot semiballoon shrimp trawl was photographed with some of the variations noted above, including operation with and without a "tickler" chain.

Cruise 22: The M/V George M. Bowers operated off Panama City on the third of a series of cruises to study the performances of various designs of Gulf of Mexico shrimp trawls. Observations and 2,700 feet of motion-picture film of trawls in action were made by divers who rode a diving sled towed by the vessel. The trip took place August 19-29, 1959.

Performances of two 40-foot trawls, rigged with several different doors and door settings, were recorded under various towing speeds and using different scopes of trawling warp. Towing speeds of over 3.5 knots were realized during these tests.

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Louisiana

GOOD OYSTER SET INDICATES FUTURE BUMPER CROP:

A big increase in oyster production in Louisiana is expected from shell-planting operations in Balck Bay in Plaquemines Parish, and in the vicinity of Petit Pass Island, Half Moon Island, and Little Raccoon Island in St. Bernard Parish.

The Chief of the Oysters, Water Bottoms and Seafood Division of the Louisiana Wild Life and Fisheries Commission said that some 350,000 barrels of clam and oyster shells had been planted in the designated areas. It further was reported that 92 percent of clam shells in the Black Bay area already have taken on spat and promise to produce a fine crop of seed oysters.

Barring unforeseen eventualities and if the tests continue to prove successful, a bumper crop of seed oysters will be developed within 15 months. The seed oysters then will be available to oystermen for transplanting on their own growing bottom.

The areas being planted by the Commission will be closed to oyster fishing until at least September 1960, it was pointed out. Mississippi oyster firms have returned--without cost to the Commission--200 barrels of steamed oyster shells for each 1,000 barrels of oysters taken in Louisiana waters. Those shells are being planted in the Little Raccoon Island area.

In 1956, the Commission planted 50,000 barrels of oyster and clam shells. From beds thus created, 150,000 barrels of seed oysters were produced. (Louisiana Conservationist, July-August 1959.)



Haddock

LANDINGS FOR JANUARY-JUNE 1959 AT RECORD LOW:

Haddock landings from Georges Bank hit a record low for the first half of 1959. The haddock abundance index, maintained by U. S. Bureau of Commercial Fisheries

biologists since 1931, reveals a drop to 9,700 pounds per day per vessel for the first six months of 1959, the first time the catch level for large otter trawlers has dipped below the 10,000-pound-perday level.

The drop in haddock landings at New England ports to about 59 million pounds during January-June 1959 (8 million pounds less than in the same period of 1958) came as no surprise to Bureau biologists who predicted last fall that haddock catches would be low in 1959.

The Director of the Bureau's Fishery Biological Laboratory at Woods Hole, Mass., reports that haddock is expected to be in short supply for at least another year, with some improvement expected in the summer of 1960.

Reason for the scarcity is thought to be poor survival of young haddock from spawnings in recent years because of unfavorable environmental conditions. What these conditions are is not known at the present time, but they may be related to changes in water temperature, changes in the pattern of ocean currents, increases in predators, decreases in plankton upon which young fish feed, or possibly to disease.

Result of the poor survival in recent years is a particularly severe scarcity of younger fish, two- and three-year-old haddock which are sold on the market as "scrod." Catches of larger haddock have held up fairly well. The shortage is most acute at the eastern edge of Georges Bank, some 250 miles from Boston, probably the world's greatest haddock-producing ground.

On the optimistic side, research vessel surveys of the banks in the fall of 1958 revealed good concentrations of young-of-the-year haddock of the 1958 brood. These baby fish, as yet too small to be taken by fishermen's nets, are due to enter the fishery when they are two years old in 1960. If their abundance lives up to present expectations, haddock catches will improve markedly in the summer and fall of 1960.

Results of the Bureau's 1959 survey, which starts in September, will provide

an up-to date measure of the abundance of the 1958 brood and provide biologists with the basis for a more definite estimate of the 1960 catch level. The survey will also measure the abundance of the 1959 crop, which will first appear in the catches in 1961 and provide the basis for predicting catches for 1961. Stocks of haddock are presently so reduced that several good year-broods will be required to restore abundance to a normal level.

Maine Sardines

CANNED MAINE SARDINE STOCKS, JULY 1, 1959:

Distributors' stocks of Maine sardines totaled 176,000 actual cases on July 1, 1959-down 8,000 cases or 4.3 percent from the 184,000 cases on hand July 1, 1958. Stocks held by distributors on June 1, 1959, amounted to 197,000 cases and on April 1, 1959, totaled 254,000 cases, according to estimates made by the U.S. Bureau of the Census.

Canners' stocks on July 1, 1959, totaled 422,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), an increase of 36,000 cases (9.3 percent) as compared with July 1, 1958, and an increase of 55.1 percent (150,000 cases) from the 272,000 cases on hand June 1, 1959. However, stocks on hand July 1, 1959, were 11.0 percent below the 474,000 cases on hand April 1, 1959.

For the 1958/59 season (beginning April 15, 1958), there was an available supply of 2,434,000 standard cases (413,000 cases carried over from the previous season plus a pack of 2,021,000 cases). The pack from April 15 to July 1, 1959, was 363,000 standard cases and the carryover as of April 15, 1959, was about 420,000 standard cases.

BOYS' CLUBS OF AMERICA "SARDINE SEACOOK" CONTEST:

The Boys' Clubs of three states (New York, excluding Greater New York, Massachusetts, and Connecticut) entered a novel sardine cooking contest, simply called "Sardine Seacook." Some 150 clubs in the four states were involved. The contest was sponsored by the Boys' Clubs of America and the Maine Sardine Council.

In view of the fact that a great many Boys' Clubs have cooking facilities within their clubhouses, the purpose of the contest was to encourage youngsters to learn more about Maine sardines, according to a news release from the Maine Sardine Council.

Existing or original recipes were allowed. Judging was based on taste, appearance, convenience of preparation in relation to the whole dish, nutritive value, and also the boy's age is taken into consideration.

After preliminary judging in the clubs themselves, a panel of food experts in New York City selected three winners from each state as state finalists. These finalists, and their executive directors, were brought to their state capital by the Maine Sardine Council for an all-expense-paid weekend, during which a "cook-off" was held to determine the State Champ. The boys met important officials of their state and were given a guided tour of the capital.

The State Champions and their executive directors went to Maine on August 28 for a week's all-expense-paid vacation as guests of the sardine industry. They met the Maine's Governor, visited points of interest, and enjoyed a full program of boating, fishing, swimming, etc. The final cookoff was held in the model kitchens of the Central Maine Power Co. at Augusta on September 1. The recipes and the

Table 1 - Canned Maine SardinesWholesale Distributors' and Canners' Stocks, July 1, 1958, with Comparisons													
Typ⊪	Unit	L	195	8/59 Seas	on			1957/58	season				
		7/1/59	6/1/59	4/1/59	1/1/59	11/1/58	7/1/58	6/1/58	4/1/58	1/1/58			
Distributors	1,000												
	Actual Cases	176	197	254	268	312	184	237	293	230			
Canners	1,000												
_	Std. Cases 1/ cans equal one stand	422	272	474	891	1,037	386	235	476	1,111			

sardine dishes prepared by the State finalists at the final cookoff were selected from among more than 1,100 submitted by boys representing 150 clubs in the three states.

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CANNED SARDINES SERVED AT GIRL SCOUT ROUNDUP:

Ten thousand girl scouts from all 50 states enjoyed Maine sardine sandwiches at a July 6 luncheon during their National Roundup, held at Colorado Springs, Colo., from July 6-12, 1959.

The sardines, supplied by the Maine Sardine Council, were served in an attractive manner and hundreds of the girl scouts ate them for the first time.

Maine sardines were also the principal item on the luncheon menu on Friday, July 9, when they were featured in a salad combination.

Council representatives attending the National Roundup to supervise the preparation of the dishes were pleased with the acceptance and popularity of the Maine seafood.

About 35 girls from the Pine Tree State were among the hungry diners who enjoyed an exciting schedule of activities in this beautiful Rocky Mountain area.

A Council spokesman stated that the contribution of 10,000 cans of sardines had been made to assist the Girl Scout movement as well as to introduce the product to many new potential users. Sardines had never before been served at a girl scout Roundup.

Two years ago the Council conducted a similar promotion with the National Boy Scout organization when 50,000 boys were served the item twice during the 4th Jamboree at Valley Forge, Pa.

The sardine cans were packed with a specially-designed cover which made a big hit with the girls and were popular souvenir items.

Marine Telephone Cables

TRAWLER-TELEPHONE CABLE MISHAPS ENDANGER LIVES AND PROPERTY:

From Newfoundland to Scotland, California to Hawaii, and from the State of Washington to Alaska, voices now travel beneath the high seas via submarine telephone cables. Like the voices which travel along miles of land cable, the submarine version is ever in danger, but from an unexpected quarter--the fishing trawler.

Conversely, these underwater communication systems provide a day-to-day threat to the livelihood of the trawler fishermen. Unlike telegraph cables, the recently established voice links in the Atlantic and Pacific carry as much as 2,500 volts of electricity. Attempts at severing a voice cable from trawler gear could seriously injure fishermen and, in some cases, even prove fatal.

Because of the immense complexities involved in deep-sea telephone cables, a 3-point plan aimed at reducing trawler-cable mishaps has recently been launched by the Long Lines Department of the American Telephone and Telegraph Company. Trawler captains are asked to: (1) familiarize themselves with charts showing underseas telephone cable routes and to avoid them as much as possible in trawling missions; (2) avoid dragging nets or dropping anchors or heavy gear near cable routes; and (3) avoid starting trawling runs that would bisect cable positions.

Fishermen are urged to use extreme caution in the event a trawling net or otter board becomes entangled with an underseas cable. The telephone company will reimburse the fishing trawler for whatever equipment has been damaged or lost in order to save the cable. Application of this 3-point safety formula when trawling near cable positions will protect telephone and telegraph communications as well as trawling equipment. This is a mutual operation and one that must be solved on the basis of mutual consideration. Charts showing the cable areas can be obtained by writing the Long Lines Department, American Telephone and Telegraph Company, 32 Avenue of the Americas, New York 13, New York.

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Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, FALL 1959:

Consumption of fishery products per civilian in the United States during the fall of 1959 is expected to average a little higher than a year earlier. Supplies of the processed items--particularly the frozen--will be heavier this fall as compared with the fall of 1958, and retail prices will average somewhat lower for popular items such as frozen fillets and shrimp.

Commercial landings of food fish and shellfish begin to build up seasonally in early spring and usually reach a peak around midyear. Total landings this year may be a little lower than in 1958 but frozen stocks are higher and imports are expected to be heavier this year than last.

At the end of June 1959 supplies were somewhat greater than a year earlier because of stocks carried over from earlier in the year and heavier imports. Commercial landings were about unchanged. Among the major items imported, the increase over the first half of 1958 was heaviest for frozen groundfish fillets (cod, haddock, hake, pollock, and cusk, and ocean perch), frozen shrimp, and canned tuna in brine. Retail prices of fishery products averaged somewhat higher this January-June than last.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's July 1959 release of The National Food Situation (NFS-89).



Massachusetts

FROZEN FOOD LAW ADOPTED:

Late in July 1959 the State of Massachusetts passed a law (containing punitive provisions), which would give the Director of Food and Drug of that State the power to set up and enforce a code to safeguard the handling of frozen foods.

Shortly before that time the Association of Food and Drug Officials of the United States had held its annual meeting in Boston, at which time a model code for the handling of frozen foods was drafted and approved.

The Director of the Food and Drug Division, Department of Public Health, Mass., has announced that the law does not become effective until 90 days after enactment. Industry committees were set up to assist the Director in the implementation of the law, after which a series of public hearings were due to be held in order to obtain the widest possible cross-section of opinion on the operation and enforcement of the law and regulations resulting therefrom.



North Atlantic Fisheries Exploration and Gear Research

UNDERWATER TELEVISION USED TO STUDY OTTER-TRAWL

PERFORMANCE:

M/V "Delaware" Cruise 59-8: Observations on otter-trawl performance utilizing underwater television apparatus (U/WTV) were carried out by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during a July 8-23, 1959, cruise. The underwater observations were recorded on film for use in studies on this type of gear.

Fishing activities were carried on near the southern portion of Stellwagen Bank, about 15 miles Northwest of Provincetown, Mass. This location provided smooth sandy bottom and water free from excessive turbidity.

The U/WTV gear utilized during these operations was an "Image-Orthicon" unit, developed and used by the Bureau Fisheries Biological Laboratory at Woods Hole, Mass. With the U/WTV camera positioned near the mouth of the trawl, film recordings from the TV monitor were accomplished using a conventional 16 millimeter motion-picture camera. Motion pictures were made of the footrope of a No. 41 New England trawl rig-

ged with rollers and with chain gear. A series of scenes were recorded showing the action of the footrope at varying speeds. Of interest in some of the sequences was the presence of several species of fish--notably cod, dogfish, skates, and flat fish. The location of the U/WTV camera was changed several times to allow different views of the gear.



Taken from a TV monitor aboard the M/V <u>Delaware</u>, research vessel of the U. S. Bureau of Commercial Fisheries. View of trawl net on bottom with rollers on right, net moving from the the right towards the left of the picture. The fish are dogfish.

The results obtained were generally favorable, considering the fact that during a large portion of the cruise heavy fog reduced available light to a minimum. Over 2,500 feet of film were exposed during the operations which extended from July 8 through July 23.



North Atlantic Fisheries Investigations

BOTTOM SEDIMENTS AND
BOTTOM ANIMALS COLLECTED:
M/V "Delaware" Cruise 59-9: A
total of 152 bottom sediment samples

were collected along the southern edge of the Gulf of Maine and on Browns Bank by the U. S. Bureau of Commercial Fisheries research vessel <u>Delaware</u>, during an August 5-11 cruise. The samples were collected over an 800-mile track at 5-mile intervals with a Smith spring-loaded bottom sampler.

The samples of bottom sediment will be studied for particle size and to obtain a quantitative measure of the organic matter contained in the sediments. In addition, 95 samples of various species of bottom animals were collected for further study. Among the many interesting specimens of bottom animals was four specimens of the rare mud crab, Calocaris macandreae.

Bathythermograph casts were made at all stations and drift-bottle hauls were released at 120 stations.



Oregon

LICENSE FEE FOR RETAILERS OF PACKAGED FROZEN FISH AND SHELLFISH INCREASED:

A new law affecting firms retailing packaged frozen shellfish only and packaged frozen food fish was announced on August 4, 1959, by the Oregon Fish Commission. The law requires those dealers to pay \$3 for their packaged frozen food fish and packaged frozen shellfish license instead of the \$1 fee previously charged. The increased fee will be effective August 5.

Those issued the \$1 license between April 1 and August 4, 1959, will be allowed to operate on the license and within regulations until March 31, 1960.

There are approximately 1,182 dealers in the State of Oregon retailing packaged frozen fish and shellfish under the frozen package license regulations, and 1,237 persons are licensed in the general retail category as food fish and shell-fish dealers yearly.

The license fee of \$7.50 for dealers operating in the general food fish and shellfish category was not changed.

Persons dealing in only the frozen package business are required to have

the \$3 license and need not purchase the general \$7.50 license.

The \$3 frozen package license as specified by Oregon Revised Statutes 508.180, listed in the Oregon Commercial Fisheries Code, applies only to retail activities dealing in species of food fish or shellfish which are wrapped, frozen, and placed in packages to which a legible lable is stamped or printed showing the name, address, brand, and trade name of the original processor or wholesale distributor under which the package is marketed, and the kind of frozen product contained therein, for distribution and ultimate sale in the original package.



Oysters

LONG ISLAND SOUND OYSTER AND STARFISH SET LIGHT AS OF JULY 30:

Setting of starfish which began on July 2, 1959, continued virtually without interruption during July, but fortunately was not too heavy. The intensity of starfish setting at the 10 stations surveyed by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., varied from a low of 10 (per 40 oyster shells, inside surface only) to a high of 237 over the July 2-30 period.

Although many partially-spawned oysters were observed in July, oyster larvae were virtually absent from plankton collections. The first larvae in Long Island Sound were found in samples taken on July 30, when a few larvae in the early umbo stage were collected at a station in New Haven Harbor in one of the 200-gallon samples.

No oyster set was observed on any of the oyster collectors examined until July 30. (Bulletin No. 2, August 4, 1959.)

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BETTER SET PREDICTED FOR CERTAIN MARYLAND WATERS:

The 1959 set of baby oysters in certain lower Maryland waters promises to

be much better than in other recent years, a shellfish biologist from the Chesapeake Biological Laboratory at Solomons, Md., reported on August 11. This was in cheering contrast with the recent announcement that last season's harvest of adult oysters was the smallest in Maryland history.

The count of spat (young oysters) on test shells in St. Mary's River is ten times what it was last year. The Barren Island area on the Eastern Shore across from Solomons is producing four times as much, and is still going strong. These areas, along with Eastern Bay and Holland Straits bars, are the primary sources of seed oysters used in rebuilding the Chesapeake's oyster bottoms. The set in Holland Straits is running about the same as last year, although its spawning season isn't quite over. Honga River is showing no change.

The biologist and his helpers have been checking test bags of oyster shells placed on the bars. The shells are picked up weekly, from late May to early October, and examined under the microscope at Solomons to determine the extent of spat set. The program has been in existence 15 years.

Test-shell examinations on a weekly basis provide another type of information--the time when oysters on a bar spawn. Bars in the Chesapeake vary one from the other as to spawning dates-most start some time in June--but each has its own distinctive "birthday," or several of them.

Such information is useful to Tidewater Fisheries Commission personnel and private planters wanting to know just when to plant shell stock. The shells make good homes for oyster spat if barnacles and other fouling organisms don't arrive first. The best shell planting time is a week before the peak of setting.

Prior to general recognition of the shell-foul problem, thousands of bushels of shell were being distributed by Maryland up to 5 and 6 months ahead of time. This is somewhat changed today; Tidewater Fisheries personnel often work night and day to throw clean shells over-

board during the crucial June days when oyster larvae are ready to set.

Keeping close tabs on test-shell spat attachment is not an exact indication of what will take place on natural oyster bottom, but a trend of the numbers of test shell spat has heretofore been followed by a comparable trend in spat on natural and planted bottoms.

Barring some upsetting act of nature a presentable crop of spat should be noted in St. Mary's River and bay waters near Barren Island this fall. It most likely won't approach the St. Mary's strike of 3,000 spat to the bushel in 1941, but it should be considerably above the 40 or 50 considered necessary for a natural bar to continue reproducing itself.



Shellfish

RESEARCH ON CONTROL OF SOFT-SHELL CLAM AND OYSTER PREDATORS:

A lindane barrier experiment to exclude green crabs from clam flats is being conducted at Pope's Creek at Wells, Me., by the U. S. Bureau of Commercial Fisheries. In this experiment, five trawl lines of about 100 hooks each have been placed across the mouth of Pope's Creek and are held on bottom by lead weights. Each hook is baited with an alewife which has been soaked in lindane to make it poisonous to green crabs. Presumably, green crabs coming from the sea will find this bait and feed on it before reaching the clam flats.

A similar barrier was successful in the smaller Upper Landing Creek last year. This experiment is being conducted in cooperation with the town of Wells and the Maine Department of Sea and Shore Fisheries. A similar experiment is being conducted by the town of Kittery, Me., in cooperation with the Maine Department of Sea and Shore Fisheries.

The Bureau's Milford, Conn., Biological Laboratory used certain vital dyes, a saturated salt solution, and chemicals to control and often eliminate fouling or-

ganisms, such as hydroids, tunicates, worms, and mussels. Sulfa drugs, antibiotics, fungicides, and temperature manipulations protected young mollusks from diseases which attack young oysters and hard-shell clams grown under hatchery conditions.

Studies at the Milford Laboratory indicate that creating chemical barriers around shellfish beds to prevent enemies from entering them may be effective, especially against oyster drills and other predacious gastropods.

The Annapolis, Md., and Franklin City, Va., Biological Laboratories developed a promising method of controlling the movement of the drills <u>Urosalpinx</u> and <u>Eupleura</u> which prey on oysters. This method consists of erecting around an oyster bed a low plastic screen fence with a strip of copper attached to it. Since drills will not cross this copper strip, they do not enter the oyster bed. In a field test of this method in 1958 on a half-acre plot, 75 percent of the oysters survived while nearly all oysters in a nearby unprotected area were lost.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1959:

Oyster Research: There was no significant change in growth rate of experimental oysters during this quarter as compared to similar periods of time in other years. Spawning and setting began a few days earlier this year, and by the first part of June the set on clean steamed cultch shell in suspended wire baskets was about 10 spat per square inch.

Mortalities began to increase with the advent of warmer weather in June. One catastrophic mortality of unknown cause was noted in a single tray of oysters kept in We Creek. In May over 50 percent of the oysters in this tray died in a three-week period. Strangely enough, other specimen oysters in another tray lying immediately adjacent were not killed.

Young seed oysters from Long Island Sound planted in November of last year have shown good growth and low mortalities. Growth and mortality rates of these imported seed follow step by step with native seed of similar age.

The experiments in the one-acre oyster pond on the affect of exposure to air were continued. In these experiments, approximately 500 adult oysters are exposed to sunlight for six hours a day; 500 are exposed to air, but are shaded from direct sun; and the same number are continuously submerged. The cumulative mortality of these experimental oysters since October 1958 for the continually submerged oysters was 18 percent; for the shaded oysters, 2 percent; and for the sun-exposed oysters, 4 percent. The higher mortalities of the sun-exposed oysters may have been due to extremes of temperature experienced during still, hot days. Monthly checks on Dermocystidium infection showed that the airexposed but shaded oysters had the highest infestation.

Shrimp Research: An analysis of 89 experimental trawl hauls made at regular stations throughout the period showed that brown-spotted shrimp (Penaeus duorarum) were twice as abundant as during the same period last year. White shrimp (P. setiferus) were seven times more abundant; and brown shrimp (P. aztecus) were five times as abundant. Commercial shrimp fishermen reported similar trends and all indications are that the shrimp season of 1959 will be the best in several years. However, the sharp decline in price in June may seriously affect the economy of the industry in South Carolina.

Crab Research: Data obtained from trawling indicate that blue crabs were about in the same degree of relative abundance from April-June this year as in the same quarter a year ago. One commercial crab plant operator reported a sharp decline in the volume of crabs caught on trot lines and in pots during June. The explanation for this may lie in unusually high tides, easterly winds, and high water temperatures. The shortage was not reflected in the experimental trawls.

Returns from the cooperative crab tagging program carried out by this Laboratory and the U.S. Bureau of Commercial Fisheries at Beaufort, N. C., show that, if the returns are sufficient to be significant, the trend of movement is to the southward. Several crabs moved from this vicinity of Bears Bluff to Savannah and a few went as far south as Sapelo Island, Ga. Additional tagging is planned during August to see if summertime tagging will change the barely apparent directional trend.

Pond Culture: Although large-scale experiments in pond culture of shrimp have been curtailed for lack of personnel, some tests are being made to determine the feasibility of using stocking methods in common practice in the Far East.

Using the pressed tea seed cake or "sapolin" supplied to the Bears Bluff Laboratory by the U.S. State Department, some preliminary tests have been made to determine the value of this product in the control of predaceous fishes. With water temperatures about 25° C. or about 77° F. and salinities of about 25 parts per thousand, even minute amounts of tea seed cake were found to be exceedingly effective in killing fish, but leaving shrimp unharmed. Spot, croaker, mullet, Fundulus, and Cyprinodons were killed rapidly without harm to white or brown shrimp. (Progress Report No. 40, April-June 1959, of the Bears Bluff Laboratories, Wadmalaw Island, S. C.)

Note: Also see Commercial Fisheries Review, July 1959,

Tuna

INDUSTRY PROBLEMS DISCUSSED AT JOINT GOVERNMENT INDUSTRY MEETING:

Representatives of several Government agencies met July 8 with representatives of the Pacific Coast tuna industry to discuss the situation of the industry and to obtain views as to ways the Government might be of assistance. Assistant Secretary Ross Leffler represented the Department of the Interior and Deputy Assistant Secretary for Economic Affairs Thomas Beale represented the Department of State. Officials of the Departments of Commerce and Navy were also present.

A spokesman representing the Southern California segment of the industry made a number of proposals for immediate, intermediate, and long-range action by the Government.

Among these were suggestions for emergency loans, flexibility in the administration of present Government loan programs, a Government-to-Government conference with the Japanese covering a range of topics from conservation to price and volume controls, implementation of a tuna research program developed at the May 19-21 meeting at La Jolla, Calif., and action on vessel mortgage insurance and construction differential subsidies.

Major emphasis was placed on the desirability of holding Government-to-Government discussions with Japan.

Spokesmen for the tuna industry located outside of the Southern California area expressed agreement with certain of the proposals above. They did not support proposals for discussions with Japan with a view to a limitation on certain exports to the United States.

The representatives of the Departments of Interior, Commerce, and State said they would give careful consideration to the plan of action proposed with the understanding that no commitment was made as to the possible attitude of the Government on the plan.



United States Fishing Fleet 1/Additions

MAY 1959:

A total of 45 vessels of 5 net tons and over were issued first documents as fishing craft during May 1959--35 less than in May of last year. The Pacific area led with 18 vessels, followed by the Gulf with 11 vessels, and the South Atlantic with 8.

During the first five months of 1959, a total of 175 vessels were issued first documents as fishing craft--113 less than during the same period of 1958.

1/Includes both commercial and sport fishing craft.

Most of the decline occurred in the Gulf area where 66 fewer vessels were documented in 1959 than in 1958.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, May 1959											
A	M	ay	Jan.	Total							
Area	1959	1958	1959	1958	1958						
		(Numbe	er)							
New England	1	1	7	8	13						
Middle Atlantic	-	4	3	7	13						
Chesapeake	4	7	34	38	99						
South Atlantic	8	14	31	51	135						
Gulf	11	27	51	117	270						
Pacific	18	17	39	46	112						
Great Lakes	-	1	3	3	10						
Alaska	3	9	7	17	31						
Virgin Islands				1	1						
Total	45	80	175	288	684						
Note: Vessels assigned to t	he var	ious se	ctions	on th	e basis						
of their home ports.											

Table 2 - U. S. Vessels Issued First														
Docu	Documents as Fishing Craft													
by Tonnage, May 1959														
Net Tons Number														
5 to 9				a		0				•		•		18
10 to 19														9
20 to 29						۰								8
30 to 39										٠				4
40 to 49								9						2
50 to 59														2
130 to 139						۰								1
280 to 289												٠		1
Total .												۰		45

* * * * *

JUNE 1959:

During June 1959, a total of 87 vessels of 5 net tons and over were issued first documents as fishing craft. Compared with the same month of last year, this was an increase of 11 vessels. The Gulf led with 25 vessels, while the Pacific area was second with 20 vessels, and the South Atlantic and the Alaskan areas were next with 13 vessels each.

Table 1 - U. S. Ve					S						
as Fishing Craf	t by A:	reas, J	une 19	59							
Anag	Area June JanJune T										
Area	1959	1958			1958						
		(N	umbei								
New England	1	2	8	10	13						
Middle Atlantic	2	- 1	5	7	13						
Chesapeake	11	6	45	44	99						
South Atlantic	13	10	44	61	135						
Gulf	25	32	76	149	270						
Pacific	20	20	59	66	112						
Great Lakes	2	_	5	3	10						
Alaska	13	6	20	23	31						
Virgin Islands	_	_	-	1	1						
Total	87	76	262	364	684						
Note: Vessels assigned to	the v	arious :	section	ns on th	e basis						
of their home ports.											

During the first six months of 1959, a total of 262 vessels were issued first documents as fishing craft--102 below the same period of 1958. Most of the decline occurred in the Gulf area where 73 fewer vessels were documented in 1959 last year.

Table 2 - U. S. Vessels Issued First
Documents as Fishing Craft
by Tonnage, June 1959

	~ ~ /	_	_	 	~:	 <u>.</u>	-	 	 	
Net T						_			_	Number
5 to	9				٠				•	33
10 to	19									20
20 to	29									15
30 to	39									6
40 to	49									7
50 to	59									1
60 to	69									2
140 to	149									1
170 to	179									1
180 to	189									1
Γ	'otal					٠		•		87



United States Fishery Experts Visit Soviet Salmon Centers

A group of four United States fishery experts left Washington, D. C., in mid-August on a visit of the salmon centers on Russia's east coast. The group arrived at Vladivostok late in August and they were expected to study the big chum and pink runs of the Amur River which contribute heavily to North Pacific salmon fisheries. In addition, the group hoped to visit the Okhotsk Sea to see the salmon fisheries in that area, and the trip is expected to end in the Kurile Islands.

Since much of the North Pacific salmon research has centered around the problem of identifying United States salmon stocks on the high seas from the comingled Asiatic stocks, it is hoped that the fishery experts will be able to obtain more data which will help the research under way.

The United States fishery experts were: W. C. Arnold of the Alaska Salmon Industry, Inc.; C. Pautzke of the Washington Department of Fisheries, C. Atkinson of the U. S. Bureau of Commercial Fisheries Laboratory at Seattle, and

C. Butler from the U. S. Bureau of Commercial Fisheries, Washington, D. C.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JUNE 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during June 1959 decreased 3.0 percent in quantity but were up 5.4 percent in value as compared with May 1959. The decrease in quantity was due primarily to lower imports of frozen and canned tuna which more than offset substantially higher imports of frozen fillets of all types, spiny lobsters, and frozen and canned salmon. The increase in value was due to more imports of such high-priced commodities as canned salmon and spiny lobsters and frozen shrimp, salmon, and spiny lobsters.

Compared with June 1958, imports in June this year were down 3.9 percent in quantity but up 5.4 percent in value. Substantially lower imports of groundfish fillets, frozen shrimp, frozen tuna (especially albacore), and canned salmon more than offset increased imports of fillets other than groundfish, canned albacore, canned sardines, canned crabmeat and spiny lobsters, and frozen sea scallops. The increase in value was due to higher imports of high-priced products like canned albacore, crabmeat, and spiny lobsters.

	United States Foreign Trade in Edible Fishery Products, June 1959 with Comparisons											
		Quantity V										
Item		ne	Year	Ju		Year						
	1959	1958	1958	1959	1958	1958						
	(Mill	ions o	f Lbs.)	(Mi	illion	of \$)						
Imports: Fish & shellfish: Fresh, frozen, &	Ì											
processed1/	80.1	83.3	956.8	27.2	25.5	278.4						
Exports: Fish and shellfish: Processed only (excluding fresh & frozen)	4.5		41.2									
1/Includes pastes, sau other specialties.	ces, c	lam o	howde	and j	uice,	and						

United States exports of processed (mostly canned fish and exclusive of fresh and frozen) fish and shellfish in June 1959 were lower by 14.7 percent in

quantity, but were 8.3 percent higher in value as compared with May 1959. Compared with the same month in 1958, the exports this June were higher by 132.0 percent in quantity and 116.7 percent in value. The higher exports in June this year were due to increased exports of canned California sardines, canned salmon, and canned squid. These items accounted for about 89 percent of total exports of processed fish and shellfish in June this year.

* * * * *

IMPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1959:

With tuna, shrimp, groundfish and ocean-perch fillets, and fish meal leading the way, United States imports of fishery products showed further increases during the first six months of 1959. The first half year's trend showed gains in canned sardines, canned salmon, canned shrimp, canned squid, and fish oils; declines were noted in canned mackerel, canned anchovies, and miscellaneous fresh or frozen fish.

Groundfish and Ocean-Perch Fillets and Blocks: Imports January-June 1959 were 20 percent higher than in the like period of 1958. Imported in greater quantities were cod fillets, up 46 percent; fillets of haddock, hake, etc., up 18 percent; and ocean-perch fillets, up 30 percent. Canadian shipments of groundfish fillets and blocks to the United States were 24 percent below those of January to June 1958; Icelandic shipments were up 101 percent.

Blocks of Bits and Pieces of Groundfish Fillets: During January-June 1959, imports were only 9 percent of the amount imported during the comparable 1958 period. Imports declared as bits and pieces will probably continue at a low level, compared to the quantity received a year ago when importers used a 1957 court ruling to obtain a lower rate of duty on fish blocks.

Tuna, Fresh or Frozen: Receipts of frozen albacore during the first six months of 1959 were 12 percent higher than during the like 1958 period. Japan was the principal supplier. Other countries, however, sent nearly 2 million pounds during January to June 1959, compared with only 10,000 pounds during January to June 1958.

During the first half of 1959, imports of other frozen tuna, mainly yellowfin, were 79 percent above those of the first half of 1958. Receipts from Japan were up 43 percent. Tuna shipments from Peru during the first half of 1959 were at a record high level.

Tuna, Canned in Brine: Imports during January-June 1959 were 17 percent above those of January to June 1958. Under the 1959 quota, the amount which may be imported at the lower 12-1/2 percent ad valorem rate is 17 percent more than under the 1958 quota.

Shrimp: The upward trend in receipts of shrimp continued during the first half of 1959. Imports were 54 percent higher than for the first half of 1958. Mexico was the leading supplier, sending 59 percent of the total. Panama was second. Shrimp imports from Japan increased by over 3 million pounds; imports from Hong Kong fell off by 1,5 million pounds.

<u>Canned Sardines</u>: During the first six months of 1959, imports of canned sardines in oil were up 22 percent over those of the comparable 1958 period owing mainly to larger shipments of Portuguese sardines, Imports of canned sardines not-in-oil were at a low level as a result of the increase in the supply of California sardines last season.

<u>Canned Salmon</u>: Receipts of canned salmon during the first half of 1959 were down 18 percent from those of the

first half of 1958. The increase in shipments from Japan did not offset the large decrease in shipments from Canada.

<u>Fish Meal</u>: January to June imports in 1959 were 81 percent higher than those during the comparable 1958 period. Peru, Canada, and Angola supplied over 87 percent of the imports.

Other Imports: During the first six months of 1959, the following products were received in substantially greater quantities than during the first six months of 1958: canned crabmeat up 57 percent, canned lobster and spiny lobster up 52 percent, oyster (mostly canned) up 39 percent, fresh or frozen sea scallops up 39 percent, and fresh or frozen frog legs up 25 percent.

* * * * *

EXPORTS OF SELECTED FISHERY

PRODUCTS, JANUARY-JUNE 1959:

Canned Sardines, Not-in-Oil: During January-June
1959, exports were nearly five times those of the comparable 1958 period. This is the result of the greater
pack of California sardines in 1958 as compared with the
low pack in recent previous years.

Canned Salmon: The Philippines took over 2 million pounds of canned salmon in March 1959. Owing to the liberalization of trade, the United Kingdom also took larger quantities during the first six months of 1959. Total exports for that period were five times larger than during the first six months of 1958.

<u>Canned Mackerel and Anchovies</u>: Low supplies resulting from small catches continued to keep exports of these products at a low level, compared with like periods of 1958 and 1957.

<u>Canned Shrimp</u>: During January-June 1959, exports were up 119 percent over those of the comparable 1958 period. Canada continued to be the largest buyer, taking 73 percent.

<u>Canned Squid:</u> Ninety-three percent of these exports were sent to the Philippines and Greece during the first half of 1959. Total exports for that period were 42 percent above those of the first half of 1958.

<u>Fresh-Water Fish, Fresh or Frozen:</u> Exports during the first six months of 1959 were 39 percent below those of the like period of 1958.

<u>Fish Oils</u>: Large purchases during the second quarter of 1959, especially by the Netherlands, were instrumental in raising fish oil exports for January-June 1959 52 percent above those of the same period of 1958.

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GROUNDFISH FILLET IMPORTS, JULY 1959:

Imports of groundfish (including ocean perch) fillets and blocks in July 1959 amounted to 20.9 million pounds—a drop of 1.6 million pounds or 7 percent as compared with July 1958. Canada continued to lead all other countries in these imports with 14.8 million pounds—a slight decline of 330,000 pounds as compared with the corresponding month of last year. Iceland was second with 2.7 million pounds—2.4 million pounds below those of July 1958, while Denmark followed with 1.6 million pounds representing a drop of 605,000 pounds. The remaining 1.9 million pounds were imports from Norway,

Miguelon and St. Pierre, West Germany, Greenland, the Netherlands, and the United Kingdom.

During the first seven months of 1959, total imports of groundfish and ocean perch fillets and blocks into the United States amounted to 104.8 million pounds. Compared with the same period of last year, this was a gain of 14.5 million pounds or 16 percent. Canada (48.3 million pounds) accounted for 46 percent of the 1959 seven months total. Imports from Iceland -- 30.5 million pounds -made up 29 percent of the total, while Denmark was next with 12.0 million pounds or 11 percent.

Note: See Chart 7 in this issue.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the $12\frac{1}{2}$ -percent rate of duty is 52,372,574 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-August 1, 1959, amounted to 26,535,173 pounds, according to data compiled by the Bureau of Customs. From January 1-August 2, 1958, a total of 26,636,243 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.



United States Fishery Landings, January-July 1959

Landings of fish and shellfish in the United States during the first seven months of 1959 were 17 percent higher than for the same period of the previous year.

The increased landings were accounted for by a 437-million-pound rise in menhaden landings. Compared with the same period of 1958, the yield of these fish was up 233 million pounds along the Atlantic Coast and 204 million pounds along the Gulf Coast. There were increased landings in New England for Maine herring (up 8 million pounds) and whiting (up 6 million pounds). Ocean perch landings declined 12 million pounds and haddock landings were down 10 million pounds as compared with the first seven months of 1958,

Alaska salmon landings dropped from 239 million pounds through August 16, 1958 to 122 million pounds during the same period of 1959. Herring landings in Alaska increased through August 16 by 10 million pounds. Tuna and jack

mackerel landings in California rose nearly 9 million pounds for each species, while Pacific mackerel declined 4 million pounds during the first half of 1959.

Table 1 - United States Fishery Landings of Certain Species for Periods Shown, 1959 and 1958 1/						
Species	Period	1959 1958 1				
		(1,000 lbs.)				
Anchovies, Calif	6 mos.	1,80 0	4,536	8,148		
Cod:						
Maine	6 mos.	1,900	1,987	2,735		
Boston	7 **	10,900	9,799	16,183 3,189		
Gloucester	1	2,000	1,843	3,109		
Total ∞d		14,800	13,629	22,107		
Haddock:		1 000	0.40	0.007		
Maine	6 mos.	1,900 46,000	2,407 58,101	3,997 81, 509		
Gloucester	7 "	9,700	7,406	9,798		
Total haddock Halibut 2/:		57,600	67,914	95,304		
Wash, and Oreg	7 mos.	14,000	12,142	16,200		
Alaska	7 ''	18,400	15,421	19,814		
		00.400	07.500	00.014		
Total halibut Herring:		32,400	27,563	36,014		
Maine	6 mos.	31,500	23,926	170,977		
Alaska	to Aug.	16 93,300	83,578	88,801		
Industrial Fish,	7	E 6 700	CE 407	100 060		
Maine & Mass. 3/. Mackerel, Calif.:	7 mos.	56,700	65,487	108,869		
Jack	6 mos.	15,300	6,524	21,698		
Pacific	6 "	6,100	10,578	24,624		
Menhaden Ocean perch:	7 "	1,135,327	698,754	1,544,700		
Maine	6 mos.	35,700	36,694	71,068		
Boston	7 "	1,800	1,404	2,625		
Gloucester	7 ''	33,600	44,619	74,951		
Total ocean perch		71,100 82,717 1				
Salmon:						
Wash. 4/	6 mos.		3,234	53,000		
Oreg. 4/	5 **	1,000 6 122 200	1,651	8,157 241,255		
Alaska	to Aug.	16 122,200 239,143 24				
Bedford (meats)	7 mos.	10,200	8,878	15,253		
Shrimp (heads-on):	7 "	05 100	00.050	105.000		
South Atl. & Gulf Washington	7 '' 6 ''	85,100 1,400	83,656 4,813	195,808 6,729		
Oregon	5 **	1,500	621	1,550		
Alaska	6 ''	6,600	3,518	7,862		
Squid, Calif	6 "	14,900	3,050	4,864		
Tuna, Calif	6 ''	137,700	128,840	307,378		
Whiting: Maine	6 mos.	6,800	8,048	23,577		
Boston.	7 "	400	208	596		
Gloucester	7 ''	33,300	26,661	58,927		
Total whiting 40,500 34,917 83,100						
Total of all above	items	1,939,527	1,597,527	3,194,842		
Others (not listed)		307,926	320,748	1,521,158		
Grand total		2,247,453	1,918,275	4,716,000		
1/Preliminary. 2/Dressed weight		/Excluding /Landed w	menhaden eight			

Table 2 - U	nited States	Fishery L	andings by	States
for	Periods Sho	wn, 1959 a	and 1958 <u>1</u> /	′

10r Periods Shown, 1959 and 1958 1/						
Area	Period	od 1959 1958		Total 1958		
		(1,000 lbs		s.)		
Maine	6 mos.	92,800	89,201	316,955		
Massachusetts 2/: Boston	7 mos. 7 '' 7 '' 7 ''	69,200 122,700 65,800 12,700	81,709 113,737 69,359 10,055	123,764 230,218 111,669 25,754		
Total Mass		270,400	274,860	4 9 1, 405		
Rhode Island 3/ New York 3/ New Jersey 3/ North Carolina 3/. South Carolina 3/. Georgia Florida 3/. Alabama Mississippi 3/. Louisiana 3/ Texas 3/ Ohio (MarJune). Oregon 2/ Washington 2/ California: Certain species 4/.	6 mos. 6 " 6 " 6 " 6 " 7 " 7 " 7 " 7 " 7 " 7 " 7 " 7 " 7 " 7	63,400 20,100 28,300 32,000 4,100 6,600 66,100 2,400 5,900 13,900 12,200 14,800 56,200	53,434 21,441 24,700 32,142 4,701 5,815 74,561 2,035 3,813 7,453 19,364 12,029 18,003 61,455	103,452 42,063 50,933 54,866 15,359 20,066 153,832 10,343 84,988 90,330 66,112 19,145 57,800 166,000		
Total Calif		197,300	175,867	663,908		
Rhode Island, Middle Atlantic, Chesapeak South Atlantic, and Gulf States (menhaden only)	e,	1 ,117,2 53	695,741	1,540,867		
Alaska: Halibut 5/ Herring Salmon Shrimp Total of all above	7 mos. to Aug. 1 to Aug. 1 6 mos. items	6 93,300 6 122,200	15,421 83,578 239,143 3,518 1,918,275	19,814 88,801 241,255 7,862 4,306,156		
Others (not listed))	6/	<u>6</u> /	409,844		
Grand total		<u>6</u> /	<u>6</u> /	4,716,000		

1/Preliminary.

2/Landed weight,
3/Excluding menhaden,
4/Includes catch of anchovies, jack and Pacific mackerel, squid, and tuna.

5/Dressed weight.

6/Data not available.

Note: --Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.



Wholesale Market

PHILADELPHIA FISH WHOLESALERS MOVE FROM DOCK STREET TO NEW FOOD DISTRIBUTION CENTER:

Dedication ceremonies for the Produce and Seafood Markets of the Philadelphia Food Distribution Center were held in mid-June this year. Many of the wholesale firms located in the old Dock Street Market moved to the seafood section of the new Food Distribution Center.



Wholesales Prices, August 1959

With an improvement in the landings of fish in New England and Northwest areas, and increased supplies of shrimp, August wholesale prices of edible fishery products (fresh, frozen, and canned) were down 2.6 percent from July and were substantially lower (7.8 percent) than a year ago, as measured by the wholesale price in-

Increased landings in the New England area, especially of haddock, were responsible for the drop of 5.0 percent in the price index for drawn, dressed, and whole finfish from July to August. The substantial drop of 35.6 percent in the ex-vessel price of drawn fresh haddock at Boston from July to August was offset to a considerable extent by higher wholesale prices for Western halibut and salmon at New York City, and generally higher prices for fresh-water fish at New York City and Chicago. Landings in the Great Lakes area in August were light which accounts for the higher prices for fresh-water fish. Compared with August 1958, the drawn, dressed, and whole



Hauling trawl aboard large otter trawler.

finfish subgroup index this August was only slightly lower. Price drops for drawn fresh haddock, dressed halibut, dressed salmon, and whitefish at New York City were almost offset by price increases for other fresh-water fish.

Most fresh processed fish and shellfish prices in August were lower than the previous month. Fresh haddock fillets were down 9.7 percent and large shrimp down 3.1 percent. The exception was shucked oysters which rose 2.1 percent in anticipation of the opening of the main marketing season on September 1. The fresh processed fish and shellfish subgroup index this August was 14.7 percent lower than in the same month of 1958 because of lower prices for haddock fillets (down 3.9 percent) and fresh shrimp at New York City (down 29.7 percent). An increase in the landings of shrimp in the South Atlantic and Gulf States and heavier imports were responsible for the drop in shrimp prices.

With supplies generally heavier than they were a year ago and the usual seasonal drop in demand during hot

weather, prices for nearly all frozen fillets and shrimp were 7.1 percent lower this August than the previous month and 15.9 percent below August 1958. From July to August this year, prices dropped for flounder fillets by 3.8 percent, for haddock fillets by 3 percent, for ocean perch by 3.5 percent, and for frozen shrimp at Chicago by 10.1 percent. Compared with August 1958, prices this August were down 7.4 percent for flounder fillets, 7.2 percent for haddock fillets, and 5.2 percent for ocean perch fillets, and 22.4 percent for large shrimp.

Since the salmon and Maine sardine packs this year are smaller than a year earlier, canned fishery products prices were up 1.5 percent from July to August. Even California sardines, which were plentiful a year ago, rose 3.5 percent this August because fishing did not commence on August 1 when the season opened in Central California since no agreement had been reached on the ex-vessel price. But compared with August 1958, prices this August for most canned fishery products were still 3.5 percent lower, except for canned salmon and Maine sardines which were priced somewhat higher,

Group, Subgroup, and Item Specification	Point of Pricing	Unit		Prices1/		Indexes (1947-49=100)		
			Aug. 1959	July 1959	Aug. 1959	July 1959	June 1959	Aug. 1958
LL FISH & SHELLFISH (Fresh, Frozen, & Canned)	• • • • •				119.8	123.0	123.5	129.9
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, Ige. & med., drsd., fresh or froz. Whitefish,L. Superior, drawn, fresh Whitefish,L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh Yellow pike, L. Michigan & Shellfish): Fillets, haddock, sml., skins on, 20-lb. tins Shrimp, Ige. (26-30 count), headless, fresh Oysters, shucked, standards	Boston New York New York Chicago New York	lb. lb. lb. lb. lb.	.11 .35 .80 .64 .80 .83	.17 .34 .76 .61 .79 .81	132.8 152.2 109.1 107.8 179.7 158.6 161.8 193.5 121.5 125.9 101.1 148.5	139.0 160.2 169.5 103.6 171.3 151.2 159.8 190.0 123.0 139.5 104.3 145.4	139,9 147,9 109,1 105,2 175,8 140,1 177,0 158,3 136,7 129,3 133,5 142,3	147.2 152.7 113.7 114.5 178.7 132.6 177.0 179.4 142.4 131.0 143.8 142.3
Processed, Frozen (Fish & Shellfish): Fillers: Flounder, skinless, 1-lb. pkg. Haddock, sml., skins on, 1-lb. pkg. Ocean perch, skins on, 1-lb. pkg. Shrimp, lge. (26-30 count), 5-lb. pkg.	Boston Boston Boston Chicago	lb. lb. lb. lb.	.38 .33 .27 .69	.39 .34 .28 .77	98.2 102.0 108.8 106.5	120.9 102.1 105.2 112.8 118.4	122.4 102.1 105.2 112.8 121.1	133.6 106.0 109.9 114.8 137.3
Canned Fishery Products: Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, It. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn	Seattle Los Angeles Los Angeles	cs,	23.75 10.80 7.50		102.0 123.9 77.9 88.1	100.5 122.6 77.9 85.1	100.4 122.6 77.9 83.9	105.7 120.0 86.2 132.4

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.





International

NORTHWEST ATLANTIC FISHERIES COMMISSION

SUOMELA ELECTED CHAIRMAN OF COMMISSION:

Arnie J. Suomela, Commissioner of the United States Fish and Wildlife Service, has been elected Chairman of the



Arnie J. Suomela

International Commission for Northwest Atlantic Fisheries, the Department of the Interior announced on June 17, 1959.

Suomela was chosen for the position at the annual meeting of the Commission held early in June in Montreal, Canada. He took office upon election. His tenure is for two years. Suomela succeeds K. Sunnana of Norway. Captain T. de Almeida of Portugal preceded Sunnana as Chairman of the Commission.

The International Commission for Northwest Atlantic Fisheries was established in 1951. It is made up of members of 12 nations whose fishermen operate off New England, Nova Scotia, Newfoundland, Labrador, and Greenland. It is primarily concerned with the groundfish (cod, haddock, hake, halibut, flounders, whiting, and ocean perch).

The technical work of the committee is done by the fishery biological research units of the member nations. Recommendations for conservation measures, such as mesh-size limitations, when adopted by the Commission are passed on to the member nations. It is the responsibility of each member nation to effect the necessary measures for the guidance of its own fishermen.

The original ten members of the Commission are: Canada, Denmark, France, Iceland, Italy, Norway, Portugal, Spain, the United Kingdom, and the United States. West Germany and Russia have since become members.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

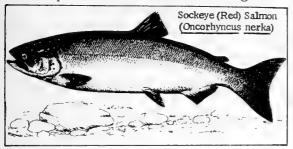
FRASER RIVER SOCKEYE SALMON FISHERY TRENDS:

July 27, 1959: United States fishermen failed to harvest their allowable share of the joint Canadian and United States Fraser sockeye catch for the week ending July 25 because of two factors. The fleet size dropped drastically over that in operation for a similar period in the brood year (1955) and gill-net efficiency dropped about 50 percent due to the small size of the fish. In 1955, 150 seines, 60 reef nets, and 400 effective gill nets were operating for the period July 18-21. This year the fleet has dropped to 90 seines, 40 reef nets, and only 175 ineffective gill nets. The United

States share of the week's catch dropped accordingly from 56 percent in 1955 to 37 percent in 1959 for an estimated total of about 30 percent of the fish available. The original regulations were designed to allow a 40 percent catch of the fish available.

To offset the effect of low fishing efficiency in United States waters, the International Pacific Salmon Fisheries Commission decided on July 27 to increase the United States fishing time for the week commencing July 26 by 24 hours for all gear.

August 11, 1959: Fraser River sockeye runs were fulfilling the most optimistic preseason estimates for a good



sea survival. Normally the runs on this cycle year have always been poor even before the Hell's Gate slide.

The Chairman of the Commission stated that catches were excellent in all Convention waters with the Canadian fleet harvesting an estimated 200,000 sockeye on August 10. The United States fleet also harvested about 90,000 sockeye on that date for a total catch of 880,000 fish. Due to the large escapements of sockeye to the spawning grounds, up to August 11, the Commission permitted an extra full day's fishing in all Canadian and United States Convention waters for the week beginning August 10.

The Commission took cognizance of the poor showing of pink salmon up to August 11. To protect against overfishing of that species, expected to appear in the fishery commencing August 16, the Commission approved a reduction of fishing time of 48 hours subject to reconsideration on the morning of August 18, effective in all United States waters and those Canadian waters lying westerly of William Head. Regulations permitting three-day fishing in Areas 17 and 18 and District I of Canadian Convention waters were not changed.

FOOD AND AGRICULTURE ORGANIZATION

ARTIFICIAL DRYING OF FISH IN AFRICA INTRODUCED BY EXPERT:

Ways and means of improving the fishdrying processes generally practiced in Africa and in other tropical regions has



been under study by the Fish Processing Section, Fisheries Division, Food and Agriculture Organization (FAO) for some time. Sun-drying of fish is the traditional African method, but it is a proc-

ess which is largely dependent on the vagaries of weather and is particularly unsatisfactory during the rainy season. The Chief of the Fish Processing Section decided that it would be possible to dry fish by artificial methods provided a simple, economical plant could be devised for this purpose.

He stated, "I concluded that the essential equipment would consist of a motor and fan and a drying tunnel. FAO arranged for me to visit several countries in Africa, taking with me a gasoline engine and a fan. In advance, I asked the Governments for their help in constructing a simple drying tunnel and sent them the necessary sketches for this purpose."

After visiting the Sudan, the FAO expert went to Uganda where he was able to carry out his experiments in a fish-processing factory on the shores of Lake Edward. Here a new tunnel was built by regional officials and an oven was also constructed.

"This was made out of an old metal container which we used as a sort of brazier," he said. "The experiment was very successful: we dried the fish very effectively in 24 and 36 hours as against the 10 to 14 days taken by sun drying during the rainy season. Unfortunately, however, the dried fish came out brown, because of smoke from the fire. I was

informed that fish in this condition would be unmarketable, so I decided to experiment again, this time with a new brazier placed lengthwise at the entrance to the tunnel and with a pipe running the length of the tunnel to carry off the smoke and fumes. I was also fortunate enough to get an electric motor from the factory to replace my gasoline motor.

"This meant that the motor could work continuously for the 36 hours required without being refuelled. However, it was still necessary to keep the oven fire alight for that time and a night watchman was put on duty to ensure that this was done."

The result of the new experiment was a batch of prime-quality artificially-dried fish which immediately won the approval of the Uganda fish merchants. Indeed, the fish industry and trade expressed the opinion that this product was superior to most of the traditional sundried fish and would not only bring a better price, but would lead to a considerable expansion in the trade.

One important development from the experiment is that the Uganda Government has decided to provide funds to buy the necessary equipment and machinery for artificial drying and establish the process in the lake fisheries.

As most of the salted-dried fish produced in Sudan and Uganda is exported to the Belgian Congo, the FAO expert had included in his itinerary a visit to that territory.

While in Stanleyville, he observed that the retail fish trade was mostly in the hands of women.

"These ladies, usually carrying the babies on their backs, came to the wholesale merchant's shop to buy the fish as it arrived by lorry," he explained. "They were, indeed, very shrewd business women and hard bargainers. The purchase of baskets of smoked fish sometimes needed a whole day."

Apart from the success of his mission in proving that a simple method of arti-

ficial drying of fish could be successfully used in the tropics—an introduction which may bring about an evolution in fish processing in these countries—the FAO expert said that his experience on the trip had shown that there were many physical and psychological factors which limited the introduction of modern fish processing methods in some regions.

Tradition, religion, and taboos often have a strong influence on what may or may not be eaten by a tribe.

"Taboos and eating habits vary from tribe to tribe in Central Africa," the expert pointed out. "For instance, some tribes refuse to eat certain species of fish because they believe the fish cause women to be barren. Others believe that if certain species of fish are eaten, the consumers will get a skin disease. These are only two examples of a great many which exist."

Such consumer habits, beliefs and preferences make it unwise to try to introduce rapidly new foodstuffs or new methods of processing them. The first need is to try to improve the traditional methods. Later, by gradual means, modern fish processing technology can be introduced which can lead to hygienic handling of the fish. But it would be a mistake to think that modern methods and modern plants and equipment can be successfully introduced at once everywhere.

INTERNATIONAL CONFERENCE OF FISH MEAL MANUFACTURERS

An International Conference of Fish Meal Manufacturers was scheduled to take place in Madrid, Spain, October 20-22, 1959. The agenda for the meeting includes general, commercial, and technical subjects on fishery products—fish meal, oil, and solubles. Countries represented included Angola, Denmark, France, Great Britain, Germany, Netherlands, Norway, Portugal, South Africa, Spain, and the United States.

EUROPEAN FREE TRADE ASSOCIATION RECOMMENDED

Ministers from Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom met at Stockholm

on July 20-21, 1959, to study a draft plan for a European Free Trade Association, generally called the "Outer Seven."

The official communique issued from this meeting announced that:

The Ministers would recommend to their Governments that a European Free Trade Association among the seven countries should be established. The object of this association would be to strengthen the economies of its members by promoting expansion of economic activity, full employment, a rising standard of living, and financial stability.

They affirmed that another purpose in establishing the association would be to facilitate negotiations with the European Economic Community (the Common Market) and the other members of the Organization of European Economic Cooperation (OEEC).

A draft plan for a European Free Trade Association was approved. The plan is to be published and officials are to be appointed to negotiate an agreement using the draft plan as a basis. The text of this agreement is to be presented to the Ministers by October 31, 1959.

Senior officials engaged in negotiating the agreement were designated as an official committee to advise governments on questions arising out of the establishment of the Free Trade Association.

The draft plan contains the following main points, according to a Swedish Embassy release:

Internal import duties on industrial commodities are to be gradually abolished between July 1, 1960, and January 1, 1970, according to a fixed time schedule. On July 1, 1960—the same date as the second reduction of import duties within the Common Market—the members of the Free Trade Association would reduce internal import duties by 20 percent. Thereafter at intervals of 18 months—12 months from 1965 and onward—internal tariffs would be re—

duced by 10 percent each time so as to be entirely abolished by the end of 1969. This draft plan proposes to follow about the same tariff reduction schedule as the Common Market.

Quantitative restrictions on imports from other "Outer Seven" members also would be gradually abolished during the transitional period.

Each member would control its own external tariffs and complaint procedures would be provided to take care of harmful deflections of trade arising out of differences in external tariffs.

To be entitled to the tariff reductions a product would have to originate within the Free Trade Association or, in general, have at least 50 percent of the same value added in the area.

Serious difficulties arising in special sectors of industry or in special geographic areas would be covered by escape-clause provisions.

Rules governing restrictive trade practices also would be included. Agricultural products are to be governed by a special agreement, according to a decision of the Ministers. This agreement would set out agreed objectives of agricultural and food policy, and would be designed to facilitate expansion of trade between members. Fish and other marine products would be treated separately as an independent problem.

The Foreign Minister of Denmark, during the Ministers' meeting, made a statement on behalf of the Danish, Norwegian, and Swedish delegations with reference to the negotiations for a common Nordic Market. The statement dealt with the progress made toward the adoption of a draft plan for a Nordic Market and the decision at the Nordic Prime Ministers' meeting held July 11-12 to adapt the plans for Nordic economic cooperation to the proposed European Free Trade Association.

After the meeting in Kungalv, Sweden, of Ministerial delegations, headed by the Prime Ministers of Denmark, Norway, Sweden, and Finland, a communique was issued stating that consideration had

been given to final Committee reports proposing a Nordic customs union, expanded cooperation in commercial policy, production, investment, exploitation of power resources, problems of finance and currency, research, and education. In addition to the agreement among the delegations for the need to adapt the Nordic Market to the Free Trade Association, the other significant decision was to present to the respective Cabinets of the countries a plan to establish a permanent Nordic Council of Ministers. (Foreign Commerce Weekly, July 3, 1959.)

Note: Also see Commercial Fisheries Review, May 1959 p. 42, February 1959 p. 40, January 1959 p. 13.



Australia

MARINE-OIL PRODUCTION, FOREIGN TRADE, AND DISTRIBUTION, 1956/57-1958/59:

Marine-oil production in Australia is confined almost entirely to oil from whaling by five land stations (including the one on Norfolk Island).

Whale-oil Production: The Australian 1956 whaling season, which commenced on May 25 and closed on October 21, was not as successful as those of recent years. Unfavorable weather conditions prevented the two west coast stations from obtaining their full quota, and as a result production of oil showed a substantial decline from the previous year. The total number of whales taken in 1958 was 1,812, of which 120 humpback whales were caught by the Norfolk Island station. Production of oil in 1958 amounted to 3,901,350 Imperial gallons as compared to 4,118,640 gallons during the 1957 season. The three stations also produced 8,859 long tons of whale meal, dried solubles, and meat for pet food.

The oil yield per whale for the 1958 season was the highest on record, with average recovery per whale at 53.80 barrels (40 Imperial gallons each). On the east coast the average was even higher, and was estimated at about 60 barrels per whale. A slight increase in

the average size of whales taken and installation of efficient recovery equipment is mainly responsible for the increase in

Table 1 - Australian Supply and Distribution of Whale Oil, Fiscal Years 1956/57, 1957/58, and 1958/59							
Supply	1958/591/	1957/582/	1956/57				
Out of the last	(In	nperial Gall	ons)				
Opening stocks Jan- uary 12/	430,799	904, 176	765, 141				
Production3/	3,901,360	4, 118, 640 79, 693	4,945,881 86,020				
Total supply			4,945,881				
Exports	3,300,000 650,000	4,021,710 650,000	3,428,066 613,639				
Closing stocks, Dec- ember 312/ 462, 159 430, 799 904, 176							
1/ Forecast. 2/ Estimated.							
3/ Includes Norfolk Island production. Source: Production from Bureau of Fisheries, foreign trade data from Bureau of Census and Statistics.							

yield. Accordingly, the lower production in 1958 was solely due to the reduced numbers of whales taken on the west coast. On the other hand, output of whale meal

Table 2 - Australian Foreign Trade in Fish and Marine- Animal Oils (Excluding Whale Oil), 1956/57-1957/58					
Products	Imports 1957/58 1956/57		Expo		
		(Imperial	Gallons)		
Cod-liver oils (incl. refined)	38, 390	72,394]		
Fish oils, unrefined, incl. penguin &			1/	\ _1/	
seal oil	96,577	97,668	17 =](=	
Other marine-ani-			11		
mal oils	17,352	24,483	[]	[]	
Total	152,319	194,545	3,343	3,270	
1/ Breakdown not available.					

and dried solubles in 1958 increased 645 tons as compared with 1957 as a result of improved recovery techniques and possibly the processing of an increased number of sperm whales.

Consumption of whale oil in Australia increased sharply during 1956/57 as a result of the installation of processing equipment by the oleomargarine industry following an increase in manufacturing quotas. Consumption of whale oil by that industry jumped from about 250,000 gallons in 1955/56 to 613,639 gallons in 1956/57, and is estimated to have risen to 650,000 gallons in 1957/58 and 1958/59. Whale oil exports during 1958/59 are expected to be substantially smaller than a year earlier. Whale oil from the 1956 Norfolk Island station catch had to be stored there for some time, occasioning a significant build-up in Australian stocks. The oil was shipped to the mainland during the following year, and helped to

Australia (Contd.):

raise exports in 1957/58 to record proportions. In 1958/59, however, stocks are back to normal and whale-oil exports are limited to the quantity in excess of local requirements, or about 3.3 million gallons.

Imports of whale oil for the fiscal years 1956/57 and 1957/58 averaged 82,856 gallons (about 90-95 percent from New Zealand).

Prices: Prices realized on the United Kingdom market for Australian whale oil were lower in 1959 than for 1958, and have fluctuated between £70 and £72 (US\$196.70-202.32) c.i.f. per long ton United Kingdom ports.

Table 3 - Australian Imports and Exports of Whale Oil, Fiscal Years 1956/57 and 1957/58					
1957/58 1956/57					
Imports: 1/	(Imperial	Gallons)			
(Country of Origin)					
United Kingdom	5,273	-			
New Zealand	74,381	77,774			
Other British countries	-	8,246			
German Federal Republic	. 39	_			
Total imports	79,693	86,020			
Exports:					
(Country of Destination)					
United Kingdom	2,209,446	1,497,062			
German Federal Republic	211, 347	770,919			
Italy	569,902	490,994			
Sweden	769,790	-			
Netherlands	_	669,091			
Other	261, 225	_			
Total exports	4,021,710	3, 428, 066			
1/ Shipments from Norfolk Island	not consider	ed as im-			
ports.					

Whale meal and solubles are under export control and are subject to approval by the Department of Primary Industry. It appears, however, that for the 1958/59 season export permits have been granted for about 2,000 long tons of solubles. During the 1957/58 season exports of all meat meals (including whale meal) totaled only 407 long tons, and the easing of export restrictions seems to indicate that the shortage of high protein feed is not as serious now as it has been for some years.



Canada

CONTROLS ON NEWFOUNDLAND'S EXPORTS OF SALTED FISH TERMINATED:

The Canadian Parliament, shortly before the end of its 1959 session, repealed all acts relating to the control of the export of salted fish from Newfoundland as of July 31, 1959. Exclusive rights to export salted fish (cod, haddock, hake, ling, pollock, and cusk) from Newfoundland has in the past been the privilege of Newfoundland Associated Fish Exporters Limited. Under the terms of the new act no export permits will be required to export salted fish and therefore the exclusive rights of the Newfoundland Associated Fish Exporters Limited have been terminated. Notification was given in 1958 that such exclusive rights would be terminated and the legislation was necessary to implement the decision.

The system of having exports under the control of a single corporate body was introduced many years ago in an effort to regularize marketing conditions and prevent uneconomic competition. The terms of Union of Newfoundland and Canada provided for the continuation of such exclusive export rights for five years from the date of Union and thereafter until Parliament decreed otherwise. It was decided last year that exports could not be controlled from one province while remaining uncontrolled elsewhere and notice was given for termination of the provision in 12 months.

* * * * *

INCENTIVE PAYMENTS FOR BRITISH COLUMBIA DOGFISH:

The Canadian Government is again providing a financial incentive this year in an effort to control the stocks of dogfish in British Columbia waters. This was announced on July 24, 1959, by the Canadian Minister of Fisheries. He said that C\$250,000 has been earmarked to cover special payments to fishermen at the rate of 10 cents a pound for dogfish livers delivered to liver-oil plants and collecting stations in British Columbia. The program is now in effect and will continue to the limit of the funds, which will be available until March 31, 1960.

Canada (Contd.):

"This year's dogfish program is a follow-up to that launched by the Federal Government on January 12 this year which terminated March 31," a statement from the Minister pointed out. "The initial effort was largely experimental to determine the most effective methods of dealing with the dogfish problem," he said.



Chile

PRODUCTION OF OIL AND MEAL BY WHALING INDUSTRY, 1956-1958:

Production of marine oils and meal in Chile is largely by the whaling industry. the latest official figures on the catch by

Table 1 - Chilean Catch of Whales, 1956-1958				
Species	19581/	1957	1956	
Blue whales Finbacks Humpbacks Sperm whales All others Total	220 210 - 1,206 - 1,636	Number) 190 200 10 990 120	207 203 3 1,154 47	
1/ Estimated.				

the whaling fleet are for 1957 when 1,510 whales were taken. This is lower by 104 whales than the 1956 catch of 1,614 whales. It was estimated the catch of whales in 1958 totaled 1,636 in number, according

Table 2 - Chilean Production of Oil, Meal, and Meat from Whales, 1956-1958

0.110 1/1000 14 -					
Product	19581/	1957	1956		
Sperm oil Whale oil	(Me 4,200 3,600	tric To 4,020 3,480	1,273 2,754		
Total oil · ·	7,800	7,500	7,027		
Meat Whale meal Bone oil $1/2/$	230 1,200 520	220 1,050 4,800	218 1,180 500		
1 / Estimated			. —		

2/ Mainly from whales, but may include bone oil from other animals.

to trade estimates. However, the yield of oil and other whale byproducts was higher in 1957 than in 1956. Production of oil from baleen whales and sperm whales during the 1956 to 1958 period showed a

steady increase from 7,027 tons in 1956 to 7,500 tons in 1957 and may have reached 7,800 tons in 1958.

Imports of whale or other marine oils into Chile are negligible. Most of the whale oil, sperm oil, and other whale byproducts produced are utilized in Chile. Most of the whale oil is used in oleomargarine production. In 1957 exports of whale and sperm oil amounted to 889 metric tons and for 1958 and 1959 exports were estimated to be about 100 tons. (United States Foreign Agriculture Service Report from Santiago, April 28, 1959.)

TUNA LANDINGS, PACK, AND EXPORTS, 1957-58:

Tuna landings in Chile during 1958 amounted to 172 metric tons as compared to 487 tons in 1957. No records are kept of landings by species, but yellowfin, bluefin, and albacore tuna are found off the Chilean coast between Arica and San

* * * * *

Chilean Exports of Tuna, 1957-581/					
Country	195 Jan. –Jun	8	19	57	
	Quantity	Value	Quantity	Value	
	Metric		Metric		
	Tons	US\$	Tons	US\$_	
United States	24	4,573	343.0	73,768	
Bolivia	-	-	0.4	150	
Italy		-	3.0	2,289	
1 / It is estimated the	1/ It is estimated that nearly 95 percent of all exports				

1/ It is estimated that nearly 95 percent of all exports were frozen tuna, and the remaining canned fish.

Fresh tuna is not exported.

2/ Data on second half of year not available.

Antonio. It was estimated that during 1957 and 1958, 10 percent of all landings were albacore, 20 percent bluefin, and the balance yellowfin.



Fig. 1 - Typical Chilean fishermen from Quintay fishing for tuna.

The canned tuna pack for use in Chile in 1958 was only 3 tons as compared to

Chile (Contd.):

28 tons in 1957. No canned tuna was produced for export in 1958, and only 8.5 tons were produced in 1957--3 tons for



Fig. 2 - Chilean fishermen bringing their catch ashore from small boats.

Bolivia, 5 tons for the United States, and 0.5 tons for Italy. (United States Embassy dispatch from Santiago, July 7, 1959.)



Ecuador

GRANT BY UNITED NATIONS FOR FISHERIES DEVELOPMENT UNDER STUDY BY FAO:

A five-man special mission of the Food and Agriculture Organization (FAO) arrived in Quito July 18, 1959, to make preliminary studies of the fishing industry, preparatory to a 1960 grant of US\$500,000 from the United States Special Fund. Ecuador will furnish another \$200,000, the total to be spent over a three-year period to study fish resources, establish an information center for fishermen, advise the fishing companies on modernization of methods, and help expand markets.



France

IMPORT RESTRICTIONS REMOVED ON SALMON AND LOBSTER:

The French Government on July 23 published a consolidation of all commodities which have been freed from import restrictions since the beginning of 1959, and canned and frozen salmon and canned lobster are included. Approximately 650 items have been recently liberalized as a result of this step which raises the total number of freed commodities to about 1,500. All but some 200 of the liberalized commodities may be imported from the United States and Canada.

INCREASE IN CANNED TUNA CONSUMPTION SOUGHT:

A large publicity campaign for increasing canned tuna consumption will soon be launched in France under the auspices of the Chambre Syndicale of France's tuna canners.

* * * * *

The consumer will be approached directly by use of a mobile kitchen which will demonstrate on all the main streets of principal cities. The mobile kitchen will show the uses of canned tuna for family cooking and provide first-hand ideas on tuna cookery to homemakers. The kitchen will also distribute samples of the various tuna dishes prepared.

The efforts of the mobile kitchen will be supported by newspaper ads and radio announcements. It is hoped that the result will be increased consumption which will relieve the present crisis that exists in the French canned tuna market.

This publicity campaign is the first step towards real action and the abandonment of the use of advertising slogans which were useful at first but later failed to do a selling job because they were no longer new enough to attract attention. (France Peche, no. 31, July-August 1959.)



Ghana

IMPORT CONTROLS ON CANNED SALMON LIBERALIZED:

Among the commodities from the so-called "dollar area" included in a list of imported items that no longer require an import license for entry into Ghana are fresh, chilled, frozen, and canned salmon and salmon trout. But canned salmon is the only product in the category of any importance. Under Notice to Importers No. 135 effective July 3, 1959, canned salmon can now be imported into Ghana under "open general license," i.e., without a specific import license or without any dollar quota being assigned to the importing firm.

Canned salmon is a luxury item in Ghana and is sold only to the wealthy in the major cities. Now that imports of canned salmon can be imported without a license, it is doubtful that canned salmon will find a major market in Ghana because of its high price as compared with cheaper canned fish. However, the removal of import controls on canned salmon may create some interest on the part of Ghana importers. (United States Embassy in Accra, July 13, 1959.)

* * * * *

U. S. DOLLAR AID FOR GHANA FISHERIES DEVELOPMENT:

The West African nation of Ghana (formerly the Gold Coast) has announced its plans for development of its fisheries. They involve plans for the establishment of two fishing ports with freezing plants and refrigerated storage. To finance these projects, it is reported that US\$2.5 million will shortly be loaned through the International Cooperation Administration and the Development Loan Fund. It is expected that realization of these plans will provide the only large-scale fishing base in West Africa. (Suisan Keizai Shimbun, Japanese periodical, July 8, 1959.)



Greece

MARKET FOR CANNED SARDINES OR PILCHARDS:

There is no production of canned pilchards as distinguished from true sardines in Greece. The sardines which are caught in Greek waters are small and thin, and though efforts have been made to can Greek sardines in olive oil, the results a

chieved were unsatisfactory. Greek production of canned sardines amounts to about 20 metric tons annually and is chiefly consumed by the Greek armed forces. Greek requirements of canned sardines or pilchards are met almost exclusively through imports.

Imports: Canned fish may be freely imported into Greece, Greek import statistics do not show canned pilchards separately; they come under the general classification "canned sardines," which also includes brisling and herring (Clupea spratus and Clupea harengus) and other sardine-like fish,

Quantity	Val	2/	
	Value ^{2/}		
Metric Tons	1,000 Drachmas	US\$ 1,0003/	
607 252 128 73 61 49 10	9,900 2,290 1,406 1,010 778 455 143 66	330 76 47 34 26 15 5	
1,184	16,048	535	
	Tons 607 252 128 73 61 49 10 4	Tons Drachmas 607 9,900 252 2,290 128 1,406 73 1,010 61 778 49 455 10 143 4 66	

From 1954 through 1958, imports of sardines or pilchards from the United States by Greece varied from 49 to 130 tons. Imports from the United States made up about 6.6 percent of the quantity and about 4.7 percent of the average value for the 1954-58 period.

Table 2 - Greek Total Imports of Sardines and Imports from

the officer Braces, 1991 of					
Year	Total Ir	nports	From Uni	ted States	
1958 1957 1956 1955	Metric Tons 1,184 1,006 1,491 1,045 1,296	US\$ 1,000 535 476 714 446 492	Metric Tons 49 105 59 130 52	US\$ 1,000 15 32 17 46 15	

In the total quantity of canned sardines imported into Greece, only small amounts of pilchards of California-type sardines are included. Imports of pilchards originate almost exclusively from the United States and Japan. Portugal and Yugoslavia supply the Greek market with sardines in olive oil, packed usually in 4-oz. cans. West Germany, Benelux, and the Netherlands ship to the Greek market sardine-like fish in tomato sauce packed in cans with the label "Sardines" affixed to them. Greek importers encourage their foreign suppliers to label cans containing sardine-like fish as "Sardines" for two reasons: (a) canned fish come under two Greek Tariff paragraphs (4d and 4e). Import duties and surtaxes assessed on paragraph 4d exceed those of paragraph 4b yabout 20 percent. Sardines and sardine-like fish are dutiable under tariff paragraph 4e. All other canned fish, including those not specifically mentioned in the Greek Tariff, are dutiable under tariff paragraph 4d. To avoid the risk of having their import shipments of sardine-like fish subjected to the higher import duty of tariff paragraph 4d, local importers demand that their suppliers label cans as "Sardines," in which case the higher import duty will not be applied; (b) this practice enables local importers to sell canned sardine-like fish of inferior quality as sardines or pilchards at prices which United States and Japanese packers of genuine pilchards are unable to meet.

Consumption: In Greece, a country with extensive sea coasts, fresh fish appeals to people more than canned fish. However, facilities for distributing fresh fish in the interior of the country are poor and it is in these areas canned fish is consumed. Greek preference is for sardines in olive oil, which are also consumed in the large cities as an appetizer. Canned sardine-like fish as well as pilchards are eaten as a regular meal by low-income groups in the provinces. These groups account for 80-85 percent of total consumption of pil-

Greece (Contd.):

chards, which is placed at about 100-120 tons annually. Inventories in late June were estimated at 25-30 tons.

The majority (95 percent) of Greek consumers prefer pilchards in tomato sauce, and the most popular can sizes are the 5-oz., 1 lb. oval, and 8-oz. oval. These sizes account for about 95 percent of total local sales, with the remainder made up of varied sizes.

<u>Prices</u>: Greek importers of pilchards insist that prices given by foreign packers be c.i.f. Greek port. The long distance involved in the case of shipments originating from Japan and California and the corollary high freight charges render preferable the quotation of prices on a c.i.f. or c.& f. Greek port (usually Piraeus) basis. It should be noted that only small quantities of South African pilchards enter the Greek market (9 metric tons in 1957 and nil in 1958). Table 3 gives prices on a c.i.f. Piraeus basis.

Table 3 - Prices for Sardines Delivered c.i.f. Greek Ports,

	January June 1858					
Country of Origin	Can	Base Unit	Price ¹⁾ US\$ Per Case	Style		
Japan	15~oz, oval 7.5-oz, '' 5-oz, tall	48 cans 96 '' 100 ''	8.35-8.90 9.85-10.25 7.80-8.20	Tomato		
United States ² /	15-oz. oval 15-oz. tall 15-oz. "	48 cans 48 '' 48 ''	9.35-9.55 7.65-7.85 7.15-7.35	Calif., Tomato		
Netherlands	7-oz. oval 8-oz. '' 6-oz. tall 14-oz. oval 14-oz. tall	48	5,20 5,40 7,40-7,70 6,60 6,30	Tomato		
South Africa	5.5-oz. tall 12-oz. '' 12-oz. ''	100 cans 48 '' 48 ''	6,60 6.30 6.50	Tomato Natural Tomato		

J/Sardines in tomato sauce packed in oval cans of 1-lb., 8-oz., and 5-oz. account for 95 percent of sardines or sardine-like fish sales in Greece.

Z/United States prices are as of January 1959. Quotations in June 1959 were lower with 48 15-oz. oval tomato cans/cs. offered at 37.00, 48 15-oz. tail tomato cans/cs. \$5.50, 48 15-oz. tall natural cans/cs. \$5.50, 100 5-oz. tail tomato cans/cs. \$6.00, f.s.s. California ports with 1.5 percent commission included.

Note: Prices are c.i.f. Greek ports unless otherwise stated and include 5-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for United States and Japanese sardines and 3-percent commission for South African sardines.

Dutch packers of herring in tomato sauce ship their product to the Greek market labeled as "Sardines." The rural population, which is the principal consumer of pilchards, does not differentiate between genuine pilchards and sardine-like fish offered as "large sardines." As a result, Dutch "sardines" are readily marketable in Greece and appear to be the strongest competitors of genuine pilchards, not only because of identical packing and style, but also because of their low price.

Considering that pilchards are consumed by the poorer classes of the Greek population, price is the deciding factor. As a result, competition among foreign suppliers of canned fish in general is very strong in the Greek market. Actual practice has shown that quality is a factor of minor importance as regards the sale of pilchards in Greece.

Import Duties: In the case of Greek tariff paragraph 4e (canned sardines and sardine-like fish), 1 metallic drachma is equal to 10.80 paper drachmas. In addition to the import duty, surtaxes amounting to 75 percent of the import duty are assessed on importation. On this basis, the import duty and surtax on canned sardines, per 100 kilograms (220.4 lbs.) would be as follows:

Most Favored Nation Countries:

Import duty - 324 paper drachmas Surtaxes - 243 paper drachmas Import duty and surtax - 567 drachmas or US\$18.90 (30

GATT Countries:

Import duty - 194,40 drachmas Surtaxes - 145,80 drachmas Import duty and surtax - 340,20 drachmas or US\$11,34

A turnover (sales) tax of 1.875 percent of the wholesale price of canned pilchards, calculated on the basis of the

c.i.f. price increased by 15 percent is also levied on imports.

Terms of Payment: Under Greek regulations, importers of canned fish in general (tariff paragraphs 4d and 4e) are required to settle payment of their orders with foreign suppliers either by Letter of Credit or cash against shipping documents presented in Greece (sight draft). Time settlement or 'in transit' shipments are not permitted. Importers must apply direct to an authorized commercial bank for an import approval (i.e. allocation of foreign exchange) prior to shipment. The issuance of such approvals is a routine operation, but a cash deposit is generally required before an approval is issued. This cash deposit amounts to 100 percent of the c.i.f. invoice value of the order plus 40 percent of the c.i.f. invoice value as an advance against import duties and other taxes, irrespective of the method of payment for the order. In cases of payment against sight draft the 100-percent deposit may, at the request of the importer, be transferred to the foreign supplier in total as full payment or in part as an advance remittance.

Outlook: Sales prospects for California pilchards do not appear favorable. Greek consumer preference is definitely for sardines packed in olive oil. Local importers state that sardines in olive oil can be stored for a long time without spoiling while canned pilchards in tomato sauce are more sensitive to the hot weather of the Greek summer months. Furthermore, canned pilchards are generally considered by local importers as a slow-moving item. Other factors that render canned pilchard imports an 'unattractive' business are: (1) under market police regulations local importers are allowed only an 8-percent profit on canned pilchards (which is further reduced when this item is distributed through wholesalers and retailers), and (2) they are required to tie up considerable amounts of capital (140 percent of the c.i.f. invoice value) for long periods of time (in the case of shipments from United States and Japan delivery time is 2-3½ months).

California packers of pilchards are further handicapped by the fact that Dutch, Belgian, and German packers of sardine-like fish are in a position to quote lower prices and effect speedier deliveries. Local importers state that the best chance of transacting business in California pilchards is in the 5-oz. and 1-lb. oval cans packed in tomato sauce and in cases of 100 and 48, respectively, provided that: (1) more advantageous prices are quoted; (2) quotations are for delivery c.i.f. Greek port; (3) payment against sight draft is accepted; and (4) cans are labeled "California sardines." The same sources, however, point out that the aggregate of these transactions cannot exceed, at present, 500-1,000 cases.

Honduras

FISHING COOPERATIVE ESTABLISHED:

The first cooperative fishing society of Honduras was established on June 14 in the Honduran port of San Lorenzo. The cooperative was organized by all the small fishermen that operate in the area of the Gulf of Fonseca on the Pacific coast.

This cooperative is one of the immeiate practical results of the new Law of Fishing recently approved by the National Congress. This Law (published in La Gaceta) is in full force and grants special privileges to cooperative bodies, such as, preference in fishing in zones in which are domiciled more than one-half of its members, and exemption from the

Honduras (Contd.):

guarantee deposit normally paid by all concession holders.

There are fifty members of the cooperative, but the possibility of increasing this number exists. The first commercial contract has already been made with a company which conducts its business in San Lorenzo.



Fisherman of Honduras holding a snook.

In respect to this new organization, it also should be mentioned that within the National Economic Council is a commission of experts organized for the purpose of writing additional regulations to the fishing law, the United States Embassy in Tegucigalpa reported on June 30, 1959.



Iceland

FISHERIES TRENDS, SECOND QUARTER, 1959:

Iceland's total white fish catch January-May 1959 amounted to 237,152 met-

ric tons as compared to 227,706 tons for the first five months of 1958, which itself was one of the best winter seasons on record. The gloom which prevailed in fishing circles during February and most of March, when exceptionally prolonged storms limited catches, was dispelled by the fine catches in April.

A notable feature of the season was the rise in the catch of ocean perch, which usually is fished by trawlers later in the year. Largely because of the effect of the 12-mile limit, which excluded Icelandic trawlers from some of their favorite cod fishing grounds, the trawlers remained late on the Newfoundland ocean perch banks before returning for the Icelandic winter cod season. Well before the end of the season many of the trawlers had gone back to North American waters. As a result, although the trawlers caught slightly more than half the cod which they had taken during the 1958 winter season they brought in considerably more ocean perch. (Total catch of ocean perch for January-May 1959 amounted to 33,767 tons as compared to 12,202 tons for the first five months of

While the 12-mile fisheries limit inhibited the trawler catches of cod, the motorboats benefited by the new limits. Due also to improvement in gear and increased use of nets, the motorboats caught 148,861 tons of cod during the first five months of 1959, compared to 134,485 tons during the same period last year. This gain was offset by reductions in the cod catch of Icelandic trawlers, however, so that the total landings of Iceland's most important fish species (cod) was slightly less for January-May 1959: 174,440 tons as compared to 180,015 tons in 1958.

Of the minor fish species, there were slight declines compared to last year. Flatfish landings were about 10 percent lower, and haddock amounted to 10,239 tons as compared to 12,778 tons for the five months in 1958.

It was the continued heavy catches of ocean perch in the waters north of Newfoundland which accounted for the fact that this year's total catch of all species

Iceland (Contd.):

of groundfish exceeded that of last year by 4.4 percent for the five-months period.

Catch statistics for June were not yet available, but reports indicated continued good landings by the trawlers. At the same time, there were indications that the new ocean perch grounds might be giving out. More days were required by the Icelandic trawlers to fill their holds, and some of the trawlers returned to home waters.

The main north coast herring season commenced with relatively bleak prospects. The Norwegian, Soviet, and Icelandic biologists who survey the area each year before the opening of the season met at Thorsavn in the Faroes to compare findings, and they issued a rather somber report featuring the scarcity of plankton and implying a poor season.

When fishing actually started, during the last two weeks of June, early results seemed to bear out this pessimism. The herring was much leaner than last year; by June 11 only 2,652 tons of salting quality had been caught as compared to 18,816 tons at the same time last year. The total catch at that date, 21,235 tons, was slightly below that for the same date in 1958 (23,701 tons).

But in mid-June, however, there has been a dramatic improvement. Not only has the herring appeared in greater volume, but the fat content has improved so markedly that a much higher proportion is available for salting. As of July 18, with some six weeks of the season still to go, herring catches were as follows:

Icelandic Herring Catches, January 1-July 18, 1958-59				
	1959		1958	
For:	•	Metric Tons		Metric Tons
salting reduction freezing	86,928 bbls. 1/230,984 mal 1/8,991 bbls. 2/	11,735 31,183 899 43,817	181, 232 bbls. 93, 161 m al 5, 534 bbls.	24,466 12,577 553 37,596
	nds each. nds each.			

Even if, as now seems quite likely, the herring catch should exceed that of last year, it is quite possible that the foreign exchange earnings would be less, because advance sales contracts for salted herring, the most valuable form of processing, have been very disappointing. There is some consolation, however, herring used for meal and oil, although less profitable, does earn free currency, whereas the bulk of the salted herring has been sold to the clearing agreement countries of Eastern Europe.

The United States, which has purchased an increasing amount of Iceland fish as a result of poor Canadian catches, has replaced the Soviet Union as Iceland's chief customer and chief supplier, reversing the relative positions of the two countries during the same period of 1958.

In preparation for the summer herring season, the Icelandic fishing industry pressed the Government for improved terms. In the Export Fund Law of May 1958 the 80 percent export premium applicable to white fish products (resulting in an effective export exchange rate of Ikr. 29.26 to the dollar) was not extended to herring, which was considered more competitive. North coast herring was limited to a 55-percent premium (comparable to the general effective rate for tourism, shipping, etc.), while south coast herring, which was considered to be in not quite so strong a position, was given a premium of 70 percent. The herring producers, many of whom suffered losses under this system last year, demanded to be placed on a basis of equality with white fish producers, with an export premium of 80 percent. -This concession actually was granted last autumn for the south and west coast herring; the north coast curers demanded parity of treatment before the opening of the 1959 summer season. Negotiations with the Government finally ended, in June, with agreement to pay a 75-percent premium on salted herring and 70 percent for herring delivered to factories for processing into meal and oil.

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REYKJAVIK CITY COUNCIL BUYS STATE-OWNED FISH PROCESSING PLANT:

The City Council of Reykjavik, Iceland, on behalf of the Municipal Trawler Company, has approved the purchase of

Iceland (Contd.):

the Icelandic Government-owned fish processing center. This plant was established by the Government in 1947 as a prototype for privately-owned fish processing and freezing plants.

The price, as assessed by independent appraisers, was fixed at Ikr. 29,250,000 (about US\$1,799,000 at the exchange rate of 16.26 Ikr. to US\$1). The Municipal Company will be faced with additional expense in expanding the capacity of the plant. It has not been decided if the present herring canning part of the center will be retained.

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SALT HERRING MARKETING PROBLEMS ARISE:

Due to reductions in advance commitments by Russia, Finland, Sweden, and a delay in negotiating a contract with East Germany, a marketing problem for Iceland's salt herring production has arisen. As of the end of June, Russia had signed up for 40,000 barrels of north coast herring as compared with the 150,000 barrels of north and southwest coast hering purchased in 1958 and 1957. Finland, which contracted for 58,500 barrels in 1958, has signed for 50,000 barrels of north coast herring this year. Sweden has ordered 60,000 barrels this year as compared with 72,500 in 1958.

Both Russia and East Germany were reluctant to open negotiations for supplies of Icelandic herring, despite pressure by the Icelanders to bring about agreements before the herring season opened. The Russians finally agreed on June 24 to take 40,000 barrels and the East Germans agreed to open negotiations on June 28, 1959.

The trade agreement between Iceland and Russia was made in 1956 and is effective until December 31, 1959. The agreement calls for 150,000 barrels of north and southwest coast herring. The East Germans contracted for 40,000 barrels of north coast and 15,000 barrels of south coast Icelandic herring in 1958.



Iran

CONTRACTS FOR CAVIAR AND STURGEON PRODUCTION SIGNED:

The National Iranian Fisheries Company (Shilat) has signed three contracts for the caviar and sturgeon production of the Caspian Sea for the year beginning July 24, 1959. The Shilat advertised for bids on March 21, 1959, which were opened on May 2, 1959. For the American and European markets this was the first occasion since 1956 that the caviar and sturgeon were open to award, because in that year a United States firm and a French firm for the European market secured 3-year contracts which expired on July 24 this year. The Soviet contract is negotiated on an annual basis.

Eight bids were submitted, of which one was American. While the American bidder won the major award for the American market, a British company was two months ago granted 5 metric tons for the American market and 5 tons for the European. This was said to be in line with the Shilat's idea of preventing a monopoly contract in any area. The Shilat has now agreed with the American bidder, however, to give him exclusive rights.

National Iranian Fisheries CompanyCaviar and Sturgeon Contract Awards						
				Bri	tish_	
	United	d States	Soviet	U.S. Mkt.	pean Mkt.	French
	Quantity Prices					
	1,000 Lbs.		(US	\$ a Pou	nd)	
Caviar: Beluga, No. 1 Beluga, No. 2	24.2 3.3	11.83 6.80	11.34	12.84 8.53	17.60 11.79	15.88 9.34
Asetra, No. 1 Asetra, No. 2	3.2 3.0	11.83 6.80	10.88 4.90	12.25 9.43	15.92 12.70	13.65 8.44
Sevruga, No. 1 Sevruga, No. 2	5.9 32.1	6.35 3.40	7.14 3.43	6.40 3.24	9.43	7,26
Pressed, No. 1 Pressed, No. 2	6.8 9.7	2.95 2.36	3,21 2,35	3.18 3.08	3.18 2.72	3.08 2.63
Total Caviar	88.2	_	-			
Sturgeon		405.00	1/320.00- 2/400.00	\$ Per T	on)	381.00
1/Second grade (less 10 percent). 2/First grade.						

The United States firm signed a contract with the Shilat on July 11, 1959, to become effective July 24, 1959, for a three-year period. The caviar and sturgeon may be marketed in any territory except Europe and the U.S.S.R. Forty metric tons of caviar are to be delivered in the first year, 50 tons the second, and 60 tons the third.

A notable aspect of the contract is the large quantity of surgeon, 250 metric tons, to be taken annually. Only 50 tons were hitherto taken by the United States, and it is understood that there was some difficulty in selling that quantity.

The Soviet contract, signed July 11, 1959, is for one year only. It calls for 46 metric tons of caviar at prices understood to be higher than last year's by 25 percent for first grade types and 20 percent for second grade types. Of this caviar, 33 tons are to be delivered in the third quarter of 1959. In addition, the Soviets agreed to take 600 tons of sturgeon at a price of US\$320 per ton (less 10 percent) for second grade, as compared with US\$340 per ton last year.

The British company contract (controlled by a Swiss national resident in Tehran) originally called for 5 tons of caviar for the American market and 5 for the European market. The contract was signed two months ago and about 4,000 pounds for the European market have already been delivered.

It is understood that the Shilat is signing a contract with the French interests, which had the previous three-year contract for 40 tons of caviar and 50 tons of sturgeon, according to a July 14, 1959, dispatch from the United States Embassy at Tehran.

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Iran (Contd.):

SHRIMP FISHERY TRENDS, APRIL-JUNE 1959:

Shrimp fishing operations in the Persian Gulf had virtually come to a halt at the end of June. The shrimp fishing company operating out of Iran had been hopeful of operating year-round, but the June trips of the two trawlers, which covered the Iranian coast from Jask to the mouth of the Shatt-Al-Arab, produced less than a ton of shrimp.

The Iranian shrimp fishing company began fishing in June 1958 and throughout the hot summer months until October their catch was negligible. The United States fishermen operating the boats are convinced that the season lasts from October through April. During the company's first year of operation approximately 285 tons of shrimp were caught with two boats in operation.

Seven 65-foot trawlers, which were scheduled to arrive on cargo vessels in late May and June, were delayed by Persian Gulf port congestion and were not scheduled to be off-loaded until mid-July. A new freezership to be used in conjunction with the trawlers is now being outfitted in Houston, Texas, and will arrive in the Persian Gulf in the fall. With the additional fleet, the operators expect to increase their catch considerably. (United States Consulate in Khorramshahr, June 30, 1959.)



Japan

CANNED FISHERY PRODUCTS EXPORTS, 1957-1958:
Exports of canned fish and shellfish by Japan in terms of cases in 1958 amounted to 9,198,000 actual cases, up by 23,3 percent from the 7,461,481 cases exported in 1957. The United States was Japan's only customer for canned tuna in brine, which accounted for 58 percent of all types of Japanese

canned tuna exports in 1958.

Increases in Japan's exports of canned salmon or salmon trout amounted to 80.0 percent, or from 1,540,211 cases in 1957 to 2,781,363 cases in 1958. Exports of all types of canned tuna were higher by 186,000 cases in 1958, with a drop of 15,7 percent in the exports of canned tuna in oil more than offset by an increase of 16,5 percent in exports of canned tuna in brine and a 427-percent increase in the exports of unclassified canned tuna.

Exports of mackerel-pike or saury were up sharply (70 percent) in 1958, but sardine exports dropped by 21.4 percent in

1958 as compared with 1957. Canned shellfish other than king crab in 1958 increased to 339,732 cases from 1957 exports of 223,435 cases.

Japanese Exports of Canned Fishery Products By Country of Destination, 1958					
Canned Product	United States	Canada	Other	Total 1958	Total 1957
			. Cases .		
Crab (king and other)	285,501	7,502	316,407	609,510	601,393
Tuna: In Oil In brine Other	2,031,584 2,931	184,564 - 7,407	1,120,501 - 164,198	2,031,584	1,744,260
Total tuna	2,034,515	191,971	1,284,699	3,511,185	3,325,256
Mackerel- pike (saury) Sardine Salmon Other fish Shellfish Other aquatic products	7,963 10,410 402,962 8,653 234,326 4,374	1,044 20 43,232 604 66,310	955,808 682,272 2,335,169 282,808 39,096 2,080	964,815 692,702 2,781,363 292,065 339,732 6,628	
Total all canned products 2,988,804 310,857 5,898,339 9,198,000 7,461,481 Source: Japanese Fish Exporters Association.					

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SUMMER ALBACORE FISHING ENDS WITH LANDINGS OF 10,400 TONS:

The 1959 Japanese summer albacore fishing season continued through July, about half a month longer than in normal years, but was about finished by early August. At that time there were no more boats on the fishing grounds, and only 2 or 3 due to land. Landings to the end of July were 10,400 metric tons, about 90 percent of which was bought by canners.

This year the canners were hoping to get about 16,000 tons of summer albacore, and the freezers' needs brought the total requirements to about 26,000 tons. Because of the shortage, the price went to 183 yen per kilogram (US\$461 a short ton) on June 26 at Shimizu, the highest ever recorded at that port. At such prices, the freezers have not been able to buy and the cold-storage warehouses are empty.

There was an unusually large number of boats fishing this year. About 200 boats from all over the country now operated between 50 and 500 miles east of

Cape Nojima during the summer albacore season. Catches per vessel did not drop after the first of July, but rather took a turn for the better. It is unusual for the number of boats fishing in July to exceed those that were out at the beginning of the season, and it is also unusual for the fishing grounds to be located so close to Japan so late in the season.

The Tokai University Fisheries Laboratory in Shimizu predicted that there would be a good possibility of large catches in early and mid-July in areas comparatively close to the coast. This prediction was supported by the fact that the majority of boats from Mie, Kagoshima, and Shizuoka prefectures had moved to grounds at 147° E. longitude and were making good catches of the smaller fish, which in normal years made up the bulk of the summer catch. Under these circumstances, the price dropped from its previous level and settled down between 145 yen and 155 yen per kilogram (\$355 and \$390 a short ton). The large 300gross-ton bait boats from Omaezaki did not do well on summer albacore. (Nippon Suisan Shimbun, July 8, 1959.)

The current Japanese frozen albacore tuna price is US\$400 f.o.b. Japan for 20-30-pound fish. No improvement in the Japanese frozen albacore export price is expected unless United States landings are light or the price in the United States goes up (Nikkan Suisan Tsushin, August 1 and 3, 1959.)

* * * * *

REPORT ON ONE EXPORT SALE OF FROZEN ALBACORE TUNA TO U. S.

Trading and negotiations by a large United States cannery have started for the purchase of mothership frozen albacore tuna produced by a large Japanese company. The first shipment, 25 tons of albacore and 150 tons of yellowfin, was shipped to the cannery of the West Coast tuna packer. The albacore base price of US\$360 a ton f.o.b. indicated that the mothership albacore export price was not as high as had been reported.

The Japanese firm plans to export 4,000 short tons of mothership-frozen albacore to the United States this year. and it is expected that almost all of this will be sold to one West Coast tuna packer. The same packer is reported also able to buy this year over 2,000 tons from another Japanese company's New Hebrides base. The concensus in Japan is that the frozen albacore price of \$360 is probably the lowest for this season. (Nikkan Suisan Tsushin, July 23, 1959.)

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ALBACORE TUNA FISHING OUT OF AMERICAN SAMOA GOOD:

Albacore tuna fishing out of the Japanese overseas base of American Samoa continues good, and the price since the first of the year has gradually risenfrom the low of US\$250 a ton. In July it jumped to \$310 a ton. For this reason, the Japanese vessel No. 18 Zensho Maru (158 tons), which fished en route to Samoa on a new ground east of Australia and caught about 90 tons, mostly albacore, landed a fare worth over US\$27,000, a new record for Samoa. (Suisan Keizai, July 18, 1959.)

* * * * *

TUNA CATCH FOR 1958 AND ESTIMATES FOR 1959: Landings of tuna in 1958 by fishing boats operating out of Japanese ports, out of foreign ports, and in South Pacific mothership fleets totaled 416,248 metric tons.

On the basis of the 1958 catch and examination of the prospects in several of the fisheries this year, estimates of the 1959 catch are (in metric tons): yellowfin 120,000, skipjack 150,000, bluefin 30,000, big-eyed 70,000, and albacore 45,000; total 415,000 tons.

Japan's Worldwide 1958 Tuna Landings					
Area		Specie	s		
of Landing	Yellowfin	Albacore	Big- eyed	Total	
	(Metric Tons)				
Japan Samoa New Hebrides Italy Brazil Cuba Trinidad Panama Haiti Argentina	76,735 1,966 1,020 11,478 6,033 1,575 1,984 3,483 2,384 5 210 4,657	46,327 8,169 2,593 115 1,119 91 24 394 219 28 2	70,048 432 135 109 210 22 28 18 47 -	3,748 11,702 2/ 7,396 1,688 2,036 3,895 2,650	
Motherships	111,530	63,177	72,979		

J Includes skipjack (147,388 tons) and bluefin (21,092 tons). Z Includes bluefin (34 tons). 3/Includes skipjack (42 tons) and bluefin (4 tons). 4/Includes skipjack (147,490 tons) and bluefin (21,130 tons).

urce: Japanese Fishery Agency.

Total fishing power is increasing gradually, as there is considerable new construction of larger and more efficient boats. The dispatching of many of the biggest tuna boats to the rich Atlantic grounds should result in a considerable increase in the yellowfin catch, although yellowfin landings in Japanese ports may be expected to decline somewhat. The Atlantic yellowfin catch will depend to a large extent on the strength of the United States canners' demand, the progress toward solution of quality problems in Atlantic yellowfin, and the opening up of additional markets in Europe, Africa, and South America. The homeland landings of albacore will be very poor, possibly less than half of last year's. The big question here is the extent to which this decline can be made up by increased effort in other areas. With respect to both yellowfin and albacore, the biggest unknown factor is the mothership fleet fishery in the South Pacific. There are plans for two additional fleets to operate this year, but the Government has not yet decided whether to permit these operations. In view of the short albacore supply, it seems reasonable to expect that such additional fleet operations might be permitted on condition that they concentrate on albacore production. There is also a possibility that revision of production quota allocations might be made to allow greater production of albacore by clippers fishing the Atlantic.

The bluefin catch looked better in the early months of this year than last year, but the landings are rather evenly distributed over a large part of the year, and it is hard to predict what the total landings may be. The species is not a factor in the export trade anyway. The abundance of big-eyed tuna usually follows that of albacore, and therefore the catch from near grounds may be expected to drop; however, good big-eyed fishing can be found by sending vessels to the central and eastern Pacific, and with the increasing demand for sausage material it seems likely that most of any decline in the western Pacific catch may be made up by operations in more distant grounds.

The skipjack catch may well be badly underestimated. Last year's landings of this species were the greatest in recent years, but this year skipjack appear to be at least equally abundant, and the scarcity of albacore in the summer season has diverted additional fishing effort to skipjack, according to a July 10, 1959, dispatch from the United States Embassy at Tokyo.

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CATCH OF TWO TUNA MOTHERSHIP FLEETS EXCEEDS 4,700 METRIC TONS:

The Japanese tuna mothership No. 3 Tenyo Maru had as of July 27 received from her catcher boats 2,544 metric tons of fish, from which 2,282 tons of products were processed and most of which consisted of: round yellowfin 650 tons, round albacore 818 tons, yellowfin fillets 75 tons, other round and filleted tunas 213 tons, and round and filleted spearfishes 211 tons.

A second tuna mothership, Nojima Maru, had taken aboard as of July 25 a total of 2,212 metric tons of fish, from which the following was produced: round albacore 252 tons, round yellowfin 344 tons, yellowfin fillet 386 tons, filleted and round spearfishes 168 tons. (Nikkan Suisan Tsushin, July 31, 1959.)

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EXPORT PRICES OF FROZEN YELLOWFIN TUNA INCREASED:

According to Japanese press reports, the Japan Frozen Food Exporters' Association on July 2, 1959, decided to raise the basic price of frozen yellowfin tuna for export to the United States by US\$25 a short ton, effective July 3.

The new tuna export prices have the status of unofficial minimum or check prices, to be enforced by agreement among members of the exporters' association. The official check prices, which are enforced by the Ministry of International Trade and Industry, remain unchanged. Under the official schedule, the basic price, that for gilled and gutted 20- to 80-pound yellowfin tuna f.o.b. Japan, is still \$220 a short ton. From this base price, various differentials are figured for other sizes of fish or for fish in other stages of preparation, as well as for transshipment exports through foreign ports.

Under the Association's new export price schedule, 20- to 80-pound yellowfin gilled and gutted will be sold at not less than \$245 a short ton f.o.b. Japan. Yellowfin 80-100 pounds will be \$235 and fish over 100 pounds will be \$215. The unofficial f.o.b. Tokyo check price for fillets will be \$235 and for dressed (i.e., beheaded) tuna, \$215. Gilled and gutted fish of 20-100 pounds transshiped through Cristobal and Trinidad will be \$230 f.o.b. with dressed fish over 90 pounds \$215, and fillets \$230. Tuna delivered at Ponce, Puerto Rico, will be subject to c. and f. check prices of \$275 for gilled and gutted 20- to 100-pound fish, \$260 for dressed fish over 90 pounds, and \$275 for fillets.

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TUNA EXPORT REGULATION COUNCIL CONSIDERS EXPORT PROBLEMS:

On July 30, 1959, the President of the Japan Federation of Tuna Fishery Associations, the Chairman of the Export Tuna Freezers' Association, the Managing Director of the Export Tuna Canners' Association, and others met with the Director of the Japanese Fisheries Agency to discuss tuna export problems, and particularly the inter-governmental negotiations proposed by United States

Secretary of the Interior Seaton, and to formerly initiate the activities of the new Tuna Export Regulation Council.

The Council discussed problem points and considered solutions in three areas: (1) adjustment of export volume and prices; (2) coordination of frozen tuna and canned tuna exports; and (3) other important matters related to tuna exports and the development of the tuna industry.

The Council will be composed of the presidents and managing directors of the three organizations, and for the time being the Council will hold regular meetings once a month. Special meetings will be held whenever one of the members or the Japanese Fisheries Agency requests consideration of a special problem. Administrative work for the Council will be handled by the Fisheries Agency.

Top officials of the Japanese Fisheries Agency explained to the tuna industry leaders assembled the content of the conversation between U.S. Interior Secretary Seaton and Japan's Agriculture Minister Fukuda and their thinking with regard to it. First of all, they wish to hear from the United States Embassy concerning the subjects for discussion at the proposed tuna conference, and if, after detailed examination, they consider that there is a necessity for the negotiations, they are inclined to accept Secretary Seaton's proposal and take part in such a conference. (Nikkan Suisan Tsushin, July 31, 1959.)

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TUNA LOIN EXPORTS, APRIL-JUNE 1959:

Japanese exports of tuna loins to the United States during April-June this year amounted to 800 short tons, according to Japan Frozen Food Exporters Association. The total consisted of albacore loins 277 tons, and yellowfin loins 523 tons. Because of very light albacore catches, the export price of albacore loins rose substantially. At the opening of the business year on April 1, the official export check price was US\$730 a

ton f.o.b Japan. The price then gradually rose until it reached around \$860 at the end of June.

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DIRECT FROZEN TUNA EXPORTS FROM ATLANTIC FISHERY TO EUROPE INCREASE:

Japanese direct exports of frozen Atlantic-caught tuna to European countries other than Italy, which began this year, had reached 2,626 metric tons by the end of June 1959.

To Yugoslavia: 435 tons on January 26 from the No. 12 Zenko Maru; 250 tons on April 2 from the No. 10 Kotoshiro Maru; 440 tons on April 15 from the Kinryu Maru; 275 tons on April 26 from the No. 26 Hoko Maru; 200 tons on May 30 from the No. 31 Hoko Maru; 310 tons on June 15 from the No. 2 Koyo Maru; total 1,910 tons.

To France: 176 tons on June 2 from the No. 1 Zenko Maru; 350 tons on June 10 from the No. 18 Symiyoshi Maru; total 526 tons.

To Greece: 190 tons on March 23 from the No. 1 Zenko Maru. (Nikkan Suisan Tsushin, July 9, 1959.)

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ASSOCIATION TO STUDY CAUSES OF "GREEN COLOR" ATLANTIC YELLOWFIN TUNA:

Percentage of rejects at California canneries of frozen Atlantic yellowfin tuna caught and delivered by Japanese has been quite high this year. Therefore, the Japan Export Frozen Fishery Products Inspection Association early in July asked the cooperation of operators of Japanese tuna vessels in the Atlantic in investigating the causes of the "green color" of some tuna after they are cooked for canning. The purpose is to improve the product and cut down on the rejects because of "green color."

Owners of vessels engaged in the Atlantic tuna fishery have been sent forms on which details of fish-handling and processing aboard the vessel are to be recorded. At the conclusion of each trip

at Cristobal or a European port, the captain will forward the report form for the cruise to the Inspection Association representative in Long Beach, Calif., or Venice, Italy. The Association will study the form on each lot of tuna and will make a detailed report through the exporting company to the vessel operator. Periodic reports of over-all findings will also be published. (Suisan Keizai Shimbun, July 9, 1959.)

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TUNA VESSELS REPORT GOOD FISHING OFF NEW ZEALAND:

According to reports received at the Japanese port of Shimizu, the fishing off New Zealand for Australian bluefin tuna is quite good this year. The Japanese vessels No. 7 and No. 8 Myojo Marus, of Omaezaki Port, have been making catches of 7 to 12 metric tons a day in the area around 38 S. 160 E. It is also reported, however, that the trade winds are strong in that area and that fishing is extremely difficult.

Nevertheless, it was expected that most of the large vessels sailing south in July would go to the New Zealand grounds. The No. 18 Kaikei Maru sailed for those grounds from Omaezaki on July 2 taking along cold-weather gear, for the air temperature in the area is 57°-59° F. (Nippon Suisan Shimbun, July 8, 1959.)

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SHIPYARD DESIGNS MORE EFFICIENT TUNA LONG-LINER:

A Japanese shipyard has completed the design of a new type of tuna long-liner that will carry over 10 percent more fish than previous types of the same size. Among the reasons why the shipyard undertook this study is the fact that, with the prospects of excess salmon fishermen coming into the tuna fisheries as a result of reorganization of the North Pacific fishery, the price per ton for tuna boat construction rights has risen very high. For this reason prospective builders are seeking designs that give a high carrying capacity in proportion to gross tonnage.

The design is for a 250-gross-ton vessel that is said to have a carrying capacity equal to a 300-ton vessel. Hitherto 250-ton boats have carried only 148 to 152 short tons, but the new design is expected to carry about 168 short tons. It will have a daily freezing capacity of 8 tons, as compared with the 3 tons usual on boats of this tonnage. (Nikkan Suisan Tsushin, July 8, 1959.)

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BUILD MORE TUNA LONG-LINERS:

A Japanese fishing company recently purchased from another Japanese firm the 700-gross-ton 1,200-hp. tuna vessel No. 10 Seisho Maru for 120 million yen (US\$336,000). The company is further planning to build two new tuna boats of 480 tons gross, for which it has already collected most of the tonnage rights. Construction will start on the first vessel this autumn.

On July 30, 1959, the Japanese Fisheries Agency published announcements of the granting of 23 fishing boat construction permits, among them a 679-gross-ton tuna long-liner (Eikyu Maru) for another fishery firm. Building of the Eikyu Maru, equipped with 1,300 hp., was scheduled to start August 1, and completion was expected in November. It will cost about 210 million yen (US\$588,000). (Nikkan Suisan Tsushin, August 1, 1959.)

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TUNA FISHERY NOTES:

With the development of the Atlantic tuna grounds, Japan's large tuna long-liners are exporting Atlantic tuna to the United States and Europe. A large Japanese fishing company is pushing plans to establish a tuna fishing base in Liberia, on the African west coast. The prospective location is either Monrovia or Sila.

The two Japanese fishing companies catching tuna for the American Samoa tuna cannery and the United States fish canner operating the Samoa cannery have agreed to raise the ex-vessel price of albacore tuna delivered to Samoa to \$275 a ton as of June 1, 1959.

The ex-vessel price of Atlantic-caught yellowfin tuna delivered by Japanese

long-liners to Yugoslavia in June was \$285 a metric ton--\$3-\$4 cheaper than earlier this year.

Miura City, Japan, in which the port of Misaki is located, has determined the leading tuna long-liners of 1958 in terms of value of catch landed. Vessels over 350 tons gross: No. 15 Marutaka Maru, 86,187,343 yen (US\$239,400); Chosei Maru, 66,378,939 yen (US\$184,400); Nachi Maru, 63,183,420 yen (\$175,000). Vessels of 200 to 350 gross tons: No. 10 Koyo Maru, 58,247,356 yen (\$161,800); No. 18 Koyo Maru, 56,563,025 yen (\$157,100); No. 11 Kompira Maru, 55,750,973 yen (\$154,900). Vessels under 200 tons gross: No. 11 Hakko Maru, 48.552,031 yen (\$134,900); No. 2 Chidori Maru, 38,490,233 (\$106,900); No. 6 Sumiyoshi Maru, 36,748,654 yen (\$102,100).

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CANNED SALMON 1959 PACK ALMOST SAME AS LAST YEAR:

All of the Japanese North Pacific salmon factoryship fleets ended operations on July 26. The 1959 pack of canned salmon by the mothership factoryship fleets and the land pack combined totaled 2,180,000 cases as compared to 2,213,000 cases in 1958.

The drop in the pack of silvers was natural because operations ended 15

Table 1 - Japanese Canned Salmon Pack					
by Species, 1958-59					
Species	1959	1958			
(Cases)					
Red	500,000	666,000			
Silver	80,000	193,000			
Pink	1,250,000	924,000			
Chum	300,000	375,000			
Tidbits	50,000	55,000			
Total	2,180,000	2,213,000			

days earlier than last year, but pink production was far above expectations because of heavy catches after the middle of July. Around the first of July it was expected that chum production might reach 400,000-500,000 cases, but catches were unexpectedly small toward the end of the season. The red catch was about as expected.

Although the total catch limit within the Japan-Soviet Treaty area was cut by 25,000 tons this year, the production of canned salmon was not much different from that of last year. With canned salmon prices up and sales going well, the operating companies cut back their production of frozen and salted salmon and canned the fish instead. Also there was a considerable increase in the catch by Hokkaido-based boats operating south of the Japanese-Soviet treaty line and consequently the Hokkaido canned salmon pack was better this year than last.

Of this year's estimated salmon pack, 50,000 cases of pinks and 150,000 cases of chums are slated for the domestic market, so it is anticipated that somewhat less than 2 million cases will be consigned to the joint sales company for export (last year 2,002,000 cases were consigned). (Nikkan Suisan Tsushin, August 1, 1959.)

The last of the 16 salmon canneryships returned from the North Pacific fishing grounds to Hakodate on August 5, ending a high-seas salmon fishing season which had started out under a gloomy threat of financial losses to all hands but which finished on a cheerfully profitable note. Because of the long drawn out negotiations with the U.S.S.R. over this year's catch quota, the fleets began fishing ten days later than they did last year, but because of good catches and favorable weather filled their catch quotas by July 27, 14 days earlier than last year. The economies resulting from this short operation and the 10-percent higher canned salmon prices this year, are considered to have made the season a profitable one for all participants.

The Japan-Soviet Fisheries Commission set the total Japanese salmon catch quota for 1959 in waters north of 45°N. latitude at 85,000 tons, a reduction of 25,000 tons from last year. Of this quota, 70,834 tons were allocated to the highseas factoryship fleets. Preliminary reports indicate that the actual catch was about 70,650 tons, with the following composition by species: red salmon, 15,400; pink salmon, 27,000; chum salmon, 24,400; silvers, 3,600; chinook, 200. Red salmon were under a special catch limit of 16,000 tons.

Surprisingly, the over-all Japanese canned salmon production this year is reported to be only slightly below that of last year, in spite of the 25,000-ton reduction of the catch quota within the Japan-Soviet treaty area.

Returning fishermen reported that Soviet patrol activities on the fishing grounds were even more intensive than last year, with two or three inspections of each mothership and visits of Soviet inspectors to several fishing boats of each fleet. Stepped-up Japanese patrols to prevent violations of treaty regulations apparently kept incidents to a minimum.

A special feature of this year's salmon fishing was a concerted effort by the Japanese to establish the degree of predation on salmon by sharks. There has been no report as yet of the findings of a vessel despatched especially for this purpose, but it is claimed that of the 100 to 500 sharks examined aboard each mothership, about 80 percent contained salmon.

The catch per mothership as of July 20, 1959, was 4,063.6 tons as compared with 4,153.8 tons as of the same date in 1958. The average per catcher was 141.3 for this season as compared to 144.5 tons for the 1958 season.

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NORTH PACIFIC SALMON FACTORYSHIP COMPANIES BENEFIT FROM SHORT SEASON:

This year's Japanese North Pacific factoryship-mothership salmon fishing has gone very smoothly. The last of 16 factoryships was scheduled to return to Hakodate on August 6, 1959. On the fishing grounds of the Aleutian area the fleets filled their catch quotas by July 27, 14 days ahead of the August 10 closing date set under the Japan-Soviet fisheries treaty, and as a result the financial losses that were feared before the season started have been avoided and all of the operating companies are considered to have profited.

This year's Japanese fishery negotiations with the U.S.S.R. resulted in a broad cut of the salmon catch quota within the treaty area to 85,000 metric tons from last year's 110,000 tons. Out of the total quota the mothership fleets were allotted 70,834 tons. According to the mothership operators, when fishing ended on July 27 about 70,650 tons of the quota had been taken, but it is considered that exact fulfillment of the quota is technically difficult.

The salmon species composition of the catch by the factoryship fleets was: reds (which were under a special voluntary limitation of 16,000 tons), 15,400 tons; pinks, 27,000 tons, or more than 30 percent of the total; chums, about 24,400 tons; silvers, 3,600 tons; and kings, 200 tons.

The main reasons for the early fulfillment of the quota (which was barely filled by August 10 last year) were: (1) This was a peak year in the pink salmon cycle, and the fish were large. Especially heavy concentrations of pinks were encountered late in July off the southern tip of Kamchatka. (2) In most years about 10 days of fishing are lost because of bad weather, but this year the weather was fine and operations were almost uninterrupted. As a result labor costs, fuel cost, and other expenses for the motherships were less than expected, while the export prices for canned salmon are up about 10 percent. Furthermore, salted salmon is selling at a high price on the domestic market, so overall money receipts are beyond early expectations. (Asahi Shimbun, August 4, 1959.)

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SALMON STUDY TEAM TO VISIT KAMCHATKA:

On August 3, 1959, the Japanese Fishery Agency announced that the Soviet Government had assented to a Japanese request to send a team to study salmon resources in Russia. At the 1959 Japan-Soviet fishery negotiations both sides agreed to exchange groups of experts for this purpose. Late in June the Japanese made their request, which has now

been answered. The Soviets are also expected to submit a specific request to Japan shortly.

The Japanese team will be headed by Professor Hiroaki Aikawa of the Kyushu University Faculty of Agriculture and will include Yoshimi Hirano of the Herring Section of the Hokkaido Regional Fisheries Laboratory, Tojiro Shinada, chief of Nichiro Fishing Company's North Pacific Division, and Jiro Imai of the Foreign Ministry. Their plan is to study salmon resources and fishing operations for three weeks, beginning August 10, at Ust-Bolsheretsk and Ozernovski in western Kamchatka. They sailed from Hakodate for Nakhodka on August 9 aboard the Fishery Agency patrol craft No. 15 Konan Maru. (Nihon Keizai Shimbun, August 4, 1959.)

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FISHING INDUSTRY ENJOYING A "QUIET BOOM:"

As of August 1959 both large and medium-size Japanese fishery enterprises were enjoying an unexpected prosperity. Because of publicity about the difficult Japan-Soviet fishery negotiations, worsening of the problems between Japan and the Chinese Communists and Koreans, and uncertainty about the form which Antarctic whaling operations will take, this prosperity has not been reflected in any marked rise in value of fishery companies' securities, but in general, all company's sales have increased at a rapid rate since spring and their business is in good shape, so that the situation can be characterized as a "quiet boom."

The following may be cited as some of the causes of this prosperity. Last year's Antarctic baleen whale oil sold on the average for export at 73,532 yen (US\$204) per metric ton, while the price for domestic sales was 85,000 yen (US\$236) for an over-all average of 74,258 yen (US\$206) per ton. This year the export price was 71,997 yen (US\$200) and the domestic price 78,000 yen (US\$217) for an average of 72,778 yen (US\$202). But this year storage costs were less, so the

price for baleen oil can be considered about the same as last year's. For sperm oil last year's average export price was 64,389 yen (US\$176) per ton and the domestic price was 75,000 yen (US\$208) for an average of 67,554 yen (US\$188) per ton. This year the over-all average sperm oil price was 57,000 yen (US\$158), a considerable drop from last year. But whale meat has sold unexpectedly well, stocks are low, and the price is about 15 percent above last year's. Furthermore, this year's coastal whaling has been extremely good.

In the salmon fishery, despite the cut in the catch quota, total production is at about the same level as last year because of good fishing south of the Japan-Soviet treaty area. Mothership fleet operations took 30 days less than last year, the price of canned salmon is 12 percent higher than last year, and frozen and salted salmon, because of short supplies, are also about 10 percent higher than last year.

Tuna prices are not much different from last year's, but the East China Sea trawl fishery had a record catch of shrimp, and the prices of mackerel-like fishes were generally up. Sales of frozen products and sausages continued strong and are expected to top last year by about 20 percent. All of these favorable factors combined have brought good sales to all companies, and the hard times that were anticipated at the end of the Antarctic whaling season and after the Japan-Soviet fishery conference have completely failed to materialize. (Nikkan Suisan Tsushin, August 1, 1959.)

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Japanese North Pacific King Crab Factoryship Pack as of July 10, 1959					
	Okhotsk (4 fleets)	Bristol Bay (1 fleet)			
July 1-10 pack Total pack to July 10 1958 pack to July 10 Target pack	17,228 216,903 188,565	f-pound cans) 1,962 70,000 1/59,850 73,500			
I/ Final on June 30. Note: Data drom Japanese Fisheries Agency as given in newspaper Hokkai Suisan for July 18.					

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KING CRAB PACK QUOTA IN BERING SEA FILLED:

The Japanese king crab factoryship fleet operating in the Bering Sea has canned its quota of king crab meat for this season, the Fisheries Agency announced early in August. The target pack established for the one fleet in the Bering Sea was 73,500 cases (48 $6\frac{1}{2}$ oz. cans). As of July 10, it had been reported that 70,000 cases had been packed. Last year the one fleet in the Bering Sea packed only 59,850 cases.

There are also 4 factoryship fleets operating in the Okhotsk Sea for king crab and the canned pack target for this season for those fleets is 280,000 cases. As of July 10, a total of 216,903 cases had been packed by those fleets.

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CANNED-FISH PET FOOD INDUSTRY:

Japanese exports of canned pet food (with fish as the principal ingredient) to the United States were expected to expand greatly this year. Shipments for the first half of 1959 totaled approximately 200,000 cases. About 80 percent of the canned pet food is made from skipjack. In July 1959 prices per case averaged 950 yen (US\$2.64) f.o.b. Japan with not much fluctuation. Packers are concentrated in Shizuoka and northeastern Honshu, and they make the pet food as a byproduct to the canning of tuna. Although the packer's margin is slim, there is considerable interest in the business because of poor sales of canned flavored flake tuna in the Japanese market.

By far the greater part of the sales are direct to United States packers, although there is some selling of Japanese packers' brands. Beginning around February and March of this year, there was a conspicuous increase in sales by trading companies direct to supermarkets, and this has upset the market in the United States. According to the Japanese traders, the wholesale price in the United States, which was around \$5.50 a case in the fall of 1958, had dropped to \$4.50 in July 1959.

Canned fish pet food was first developed in Japan by a firm in Shimizu three years ago, and now nearly 40 firms in Shizuoka Prefecture are using fish to make canned pet food.

Shizuoka fish canners pack white meat and light meat canned tuna from albacore and skipjack and thereby earn for Japan about 10 billion yen worth of dollars (US\$27.8 million) every year. The scraps and dark meat waste are packed as flakes for the domestic market. However, canning the tuna waste as pet food seems to be more remunerative and now about 60 percent of the tuna flake material is packed as pet food.

The canned pet food is packed in No. 2 tuna cans. The contents of the cans are less than for flakes for human consumption, there is no need to add soy sauce, and when skipjack is used as raw material the manufacture of pet food is about 20 percent more profitable than the manufacture of tuna flakes. Furthermore, whether the ultimate consumer is a cat or a human being, as an export product the canned pet food enjoys tax exemption and a rebate on the cost of the cans. This year's production in Shizuoka Prefecture will be about 600,000 cases, worth 600 million yen (US\$1.7 million), and a United States importer who recently visited Shimizu stated that pet food orders could easily reach 1 million cases annually.

About a year ago a Tokyo pet dealer had the idea of introducing canned food for cats and dogs in that city, but in Japan the cats and dogs, like their masters, subsist mainly on rice, and they showed little interest in canned food, so the business did not prosper. Greater care is to be taken in the packing of canned pet food for export to the United States than is done in the case of canned fish for human consumption in Japan. (Nikkan Suisan Tsushin, July 26 and 31, 1959.)

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CANNED PET FOOD EXPORTS TO UNITED STATES CONTINUE AT HIGH RATE:

Japanese exports to the United States of canned pet food or animal food (with

fish as one of the principal ingredients) continued at a high rate, Shimizu area reports indicate. In June this year 33,730 cases were exported to the United States, substantially exceeding the expected exports of 30,000 cases. If exports continue at this rate, it is expected that 1959 exports will amount to 300,000 cases as compared with 200,000 cases in 1958. The current f.o.b. Japan price is reported at \$2.90 a case. (Industrial News, July 23, 1959.)

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ADDITIONAL BERING SEA FISH-MEAL FACTORYSHIP TO BE LICENSED:

Domestic and foreign demand for fish meal as an additive to feed for domestic animals has recently been on the increase, and a number of large fishing companies in Japan have made application for permits to engage in factoryship operations in the Bering Sea. The Japanese Fisheries Agency is expected shortly to license some additional fleets.

At present two companies are each operating one fleet, with a total annual meal production (principally from flat-fish) of 18,000 tons planned. If the Fisheries Agency issues licenses, next year there are expected to be three additional fleets. Each fleet would have a planned production of 8,000-10,000 metric tons.

According to the Fishery Agency's investigations, the annual world demand for fish meal is about 1.3 million tons, and the supply is about 200,000 tons short of that amount. In the case of Japan, almost all of the production is exported, and recently there arose a shortage to meet domestic demand. Therefore the Government is inclined to license additional production on the grounds that it is not likely to push the price down from the present level.

The question of conservation of the resource is a delicate one and the Fisheries Agency has stated that beginning this year full-scale studies will be started on the resources which supply the

raw material for fish meal. (Nihon Keizai Shimbun, August 4, 1959.)

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FISH MEAL PLANT ORDERED FOR BERING SEA FACTORYSHIP OPERATION:

A Japanese fishing company recently ordered a fish-meal plant from Germany for its planned fish-meal factoryship operations in the Bering Sea next year. Importation of this plant will require 90 million yen (US\$250,000) in foreign exchange, of which the Japanese firm paid down 27 million yen (US\$75,000) when the order was placed. Importation and assembly of the plant in Japan will cost another 60 million yen (US\$167,000), bringing the whole cost to 150 million yen (US\$417,000). The plant, which will process 500 tons of fish a day, is scheduled to reach Yokohama from Hamburg around the middle of next March. (Nikkan Suisan Tsushin, August 1, 1959.)

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PACK QUOTA FOR CANNED MACKEREL-PIKE BY STYLE AND CAN SIZE:

The Japanese Export Canned Saury Producers' Association met July 21 and decided on the pack quota for canned saury or mackerel-pike by style of pack and can size for the 1959 production year (August-July 1960). It is planned to pack 60,000 cases of 4 dozen No. 4 cans in tomato sauce; 275,000 cases of tall No. 1 cans in brine; and 325,000 cases of 4 dozen No. 4 cans in brine; a total of 660,000 cases. Because inventories of old merchandise are excessive and sales are slow, it was decided not to produce any oval No. 1 cans, oval No. 3 cans, or tall No. 1 cans in tomato sauce, which have been the principal pack categories in the past. Selling prices will remain unchanged, but because the market conditions are unstable, the market development assessment (a fund for taking care of price fluctuations) was raised to 100 yen (about 28 U.S. cents) a case, double last year's assessment, so the packer's actual receipts will be lowered on the average by about 50 yen (14 U.S. cents) a case.

Plans for export sales in the 1959 export year are as follows (in cases): Egypt 170,000, Burma 150,000, Singapore and Malaya 48,000, Ceylon 175,000, New Guinea 110,000, West Africa 55,000, Philippines 252,000, other countries 45,000. Old stocks carried over from last year's total 360,000 cases; new production will be 660,000 cases. (Nikkan Suisan Tsushin, July 22, 1959.)

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JAPANESE FIRM TO EXPLORE FOR SHRIMP OFF MEXICAN WEST COAST:

A Japanese trading firm has entered into an agreement with a Mexican firm to explore for shrimp off the Mexican west coast. The Japanese No. 16 Myojin Maru (150 tons) and the No. 8 Hajime Maru (135 tons) were scheduled to sail for Mexico on August 10, 1959. Skilled personnel (7 men) from the Shimonoseki office of a Japanese fishing company were due to accompany the expedition. The Japanese company intends to enter the shrimp fishery, if its fishing ground surveys show that the enterprise looks promising. However, the company does not appear to be taking a very optimistic view until the results of exploration are known. (Nikkan Suisan Tsushin, July 23, 1959.)

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SHRIMP LANDINGS AND FOREIGN TRADE, 1954-1958; Landings of shrimp in Japan in 1958 totaled 55,463 metric tons, or about 9 percent higher than the average landings of 50,273 tons for the 1954-1958 period. However, both exports and imports have increased sharply during the five

Table 1 - Japanese Landings of Spiny Lobster and Shrimp, 1954-1958 Product 1958 1957 1956 1954 1955 (Metric Tons) . . Spiny lobster . . 1.212 1,158 1,237 1,346 1,020 Shrimp: "Kuruma" prawn 2,784 2,051 2,306 2,561 2.355 Other shrimp ... 52,679 45,427 47,917 44,700 48,585 Total shrimp . . . 55,463 47,478 50,223 47,261 50,940

years between 1954 and 1958. Exports of fresh and frozen shrimp were up elevenfold (from 289 tons to 3,484 tons) from 1954 to 1958. Imports increased from 69 tons to 4,159 tons in the same period.

The United States was Japan's principal customer for frozen shrimp and in 1958 imported 77.0 percent (2,682 tons) of the total Japanese exports of 3,484 tons. Between 1954

and 1957 the United States imported about 95 percent of the Japanese exports of frozen shrimp.

Table 2 - Japan's Exports and Imports of Shrimp, 1954-1958						
	Fresh or Frozen	Dried or Salted	Canned	Total		
	(1,000 Lbs.)					
Exports:		1				
<u>1958</u> :						
All Exports	3,484	904	42	4,430		
To U. S.	2,682	233	12	2,927		
1957:						
All Exports	2,630	949	39	3,618		
To U. S.	2,525	190	31	2,746		
1956:						
All Exports	2,417	1,006	59	3,482		
To U. S.	2,368	219	31	2,618		
1955:	000	4 004				
All Exports	865	1,031	$\frac{1}{1}$	1,896		
To U. S. 1954:	827	118	1/	945		
	289	4 005	.,	4 050		
All Exports To U. S.	269	1,387	$\frac{1}{1}$	1,676		
100.5.	209	99	1/	368		
Imports 3/:						
1958	4,159	53	21	4.212		
1957	3,269	131	2/	3,400		
1956	45	1 1	1/	46		
1955	- ***	132	\ \frac{1}{1}'	132		
1954	69		$\begin{array}{c} \frac{2}{2}/\\ \frac{1}{1}/\\ \frac{1}{1}/\end{array}$	69		
1/Not classified separately be 2/Less than 1,000 pounds. 3/Not classified as to country	fore 1956.		 '			

The United States is also an important customer for Japanese dried or salted shrimp. United States imports of this product from Japan ranged from a low of 99 tons in 1954 to a high of 233 tons in 1958.



Libya

FISHERIES TRENDS, APRIL-JUNE 1959:

Tuna: In the Tripolitania area of Libya, the tuna-fishing season began under very inauspicious circumstances. By mid-April only 6 of the 10 companies engaged in this industry in 1958 were able or willing to resume operations. Most of the other firms found themselves unable to compete as increased production costs (mainly due to new labor and social insurance laws) compelled them to cease activities. At least one of the active companies had labor troubles when its fishermen went on strike, but the company's threat to close down completely soon resulted in a compromise.

It was unfortunate that four of the tuna processing firms ceased operations, because the tuna catch surpassed expectations. During the May-to-early-June period the companies operated off the western Tripolitania coast and although

Libya (Contd.):

the season was not over, they had caught about 12,000 tuna, weighing approximately 1,200 metric tons. Since mid-June the fishing has been concentrated off the eastern shores of the Province and the catch continued better than average.

Sponges: The sponge fishing season in Tripolitania continued on at a very low level as the Greek fishing fleet did not begin to make its annual appearance until the very end of the period. Only five Libyan firms were engaged in sponge fishing this year. By mid-June their combined catch totaled no more than 1,500 kilos (3,306 pounds). It was expected, however, that the arrival of the Greek vessels (about 60 were expected) would result in much greater production as they operate in deep water where the quantity of sponges obtained is much greater and the quality higher than those secured just offshore by the local firms.

In Cyrenaica the sponge fishing industry, once one of the principal industries of the Province, was virtually dead as far as the 1959 season was concerned. Unwilling to meet the terms of the Cyrenaica sponge monopoly (LL500, or about US\$1,400 a license, 40 licenses minimum), Greek sponge fishermen lost interest in this fishery, at least for the present season. (United States Embassy dispatch from Tripoli, July 14, 1959.)



Malaya

JOINT JAPANESE-MALAYAN TUNA FISHING COMPANY FORMED:

Negotiations for the establishment of a joint tuna fishing enterprise by a large Japanese fishing company and a Malayan marine products company have been completed and papers were signed on July 6, 1959, at Penang. The new company is capitalized at 500,000 Malayan dollars (US\$164,000), of which the Japanese side has put up 49 percent.

Operations will be started shortly with five 150-ton tuna boats. (Suisan Keizai Shimbun, July 8, 1959.)



Mexico

ENSENADA AREA

FISHERY TRENDS, JULY 1959:

The Mexican Office of Fishery Inspection in Ensenada reports that the 1958/59 spiny lobster season (October to March) was exceptionally good. About 1,960,000 pounds of spiny lobster were landed as compared with average annual landings of 1,000,000 pounds.

The fish canneries in Ensenada, which have been complaining of lack of business for the past few years, are doing better. Two which have been idle are now working again. There are now ten canneries operating in the Ensenada area, the United States Consulate in Tijuana reported on July 10, 1959.



New Zealand

FISHERIES TRENDS, 1958:

Landings in 1958 of fish and shellfish in New Zealand of about 55.3 million pounds were down about 1 percent from the 55.8 million pounds landed in 1957. The lower demand for export fish, especially to Australia, contributed to a lower catch.

Spiny lobster landings in 1958 declined 12 percent to 9.8 million pounds from 11.1 million pounds in 1957. The 1958 landings of this product were close to 33.2 percent under the landings for 1956. The record catch of 183 humpback whales at Tory Channel Station in 1958 yielded 1,538 short tons of whale oil, 448 tons of whale meat, and 134 tons of bone meal. The station at Great Barrier Island did not operate during 1958, but will operate in 1959. The season so far in 1959 has been exceptionally good with more whales than available catchers.

Exports of frozen fish declined to about 5.3 million pounds in 1958 from 7.3 million pounds in 1957 and spiny lobster exports (mostly tails) dropped sharply to only 2.6 million pounds from 4.4 million pounds in 1957. Most of the tails are exported to the United States.

New Zealand (Contd.):

During 1958, regional committees, consisting of representatives of the wholesale, retail, and production side of the fish industry were set up in Auckland, Gisborne, Napier, Wellington, Otago, West Coast, and Nelson to assist and guide the Fishing Industry Advisory Council in the consideration of local problems. The question of licensing of the fishing industry has been under study and a report on this problem prepared by the Council is being examined by the Marine Department.



Norway

FISHING AND WHALING INDUSTRY TRENDS, JUNE 1959:

A total of 769,503 metric tons of fish was landed in Norway from January 1 to

June 13, 1959, as compared to 765,611 and 1,183,144 tons during the same periods of 1958 and 1957, respectively. Most of the annual catch is landed during the first half of the year.

The fishermen's marketing organization (Norges Raafisklag) in North Norway and the dominant fish filleting and freezing concern (Norsk Frossenfisk A/L) are in a long and bitter dispute over fish prices. The Government recently ruled that the difference between the prices set by the marketing association for fish sold to the freezing industry and for similar fish sold to dryers and salters shall be substantially less than that heretofore in effect. The marketing association immediately renounced an agreement it had recently concluded with the freezing industry providing for somewhat lower prices during the summer months. The fish fillet and freezing concern has announced its intention to sue the fishermen's marketing organization for breach of contract.



On the herring fishing grounds off west coast of Norway. Large purse seine set around a submerged school of herring. Seine has been pursed and net is lifted into the mechanized purse-seine dories to concentrate the fish in the bag of the net.

The Ministry of Fisheries has submitted a report to the Norwegian Storting with proposals for improving profits in the fishing industry. These proposals are based on the recommendations of the Brofoss Committee and differ from them only in detail. The Ministry recommends, among other things, the replacement of many of the smaller boats with 65- to 85-foot vessels, the building of more large ocean-going trawlers, the use of more powerful engines, increased fisheries research, additional credit facilities for fishermen, and subsidies on tackle and equipment to take the place of fish-price supports.

Replying to a question in the Storting, the Foreign Minister stated on May 19, 1959, according to the press account, that the extension by the Faroe Islands of its fishing boundary would not adversely affect Norwegian fishing interests. He added that Norway would continue to take no unilateral action on the fishing boundary question before it had been discussed at the Law of the Sea Conference scheduled to be held in Geneva next year.

Following the meeting of the International Whaling Convention in London. which ended in a deadlock and resulted in Norway's withdrawal from the Convention, the Minister of Industry and Handicrafts was reported to have stated that Norway will continue to abide by the regulations of the Convention pertaining to the conservation of whale stocks and that toward this end the Government will later in the summer establish a national quota for the Norwegian expeditions. He is reported to have stated further that in the event any initiative is taken to hold further talks on the allocation of whale quotas among the whaling nations, Norway would promptly participate.

The last unsold stocks of whale oil from the Norwegian production during the 1958/59 Antarctic whaling season have been sold. (United States Embassy dispatch from Oslo, dated July 16, 1959.)

MARINE OILS AND FISH MEAL PRODUCTION, FOREIGN TRADE, AND DISTRIBUTION, 1956-1959: Marine Oil: PRODUCTION: Total production

Marine Oil: PRODUCTION: Total production of marine oils by Norway declined from about 257,000 metric tons in 1957 to about 202,000 tons in 1958, and is expected to remain at roughly 200,000 tons in 1959. The forecast for 1959 is based on the final estimates of the Antarctic whaling expedition and the returns from the Norwegian winter herring fisheries (both of which are completed for 1959).

The production of Antarctic whale and sperm oil was lower by 15 percent in the 1957/1958 season. The nine Norwegian expeditions participating in the 1957/1958 whaling season produced 123,946 tons of whale oil and 20,751 tons of sperm oil. The Norwegian shore station at Husvik Harbor was not operated during 1958.

Preliminary results from the 1958/59 Antarctic whaling season indicate a further reduction of whale and sperm oil production. According to preliminary reports, the total Norwegian production of whale oil from the nine floating expeditions and the Norwegian shore station at Husvik Harbor is only 123,803 tons of whale oil and 14,904 tons of sperm oil.

The 1958/59 pelagic season started January 7 and ended on March 16, 1959, while the Norwegian shore station was in operation from October 1, 1958, through March 31, 1959.

The two Norwegian shore stations which operate with six catcher boats off the coast of Norway produced 672 tons of sperm oil and 612 tons of whale oil in 1958 as compared with 227 tons of sperm oil and 769 tons of whale oil in 1957. The two stations operated in the summer of 1959.

The production of herring oil in 1958 totaled only 34,000 tons in 1958 as compared with 17,424 tons in 1959 and 110,828 tons in the record year of 1956. The winter herring, which is the main basis for the Norwegian production of herring oil, arrived late in the season and, in addition, fishing was severely hampered by high winds. As a result, the total catch was only 3,712 million hectoliters (345,116 metric tons), or 43 percent of the catch in 1957, which also was a poor year.

The outlook for 1959, although slightly better than in 1958, is still not very promising.

The Ministry of Fisheries, which furnishes the most accurate estimates on fish-liver oil production, has estimated that total production of fish-liver oil in 1958 totaled about 16,500 tons, or about 18 percent more than in 1957. Preliminary reports indicate a further increase in the production of fish-liver oil in 1959.

The results from the 1958 sealing season were very good. The registered catch of seals was increased from 208,271 in 1957 to 260,819 in 1958. The total landed value of the catch increased from 12.5 million kroner (US\$1.8 million) to 17.2 million kroner (US\$2.4 million) and the estimated production of seal oil was about 5,500 tons as compared with about 4,700 tons in 1957.

Table 1 - Norway's Production of Marine Oils, 1956-1959						
Commodity	19591/	1958	1957	1956		
			Tons)			
Cold cleared cod-liver oil	12,000	11,900	10,300	12,400		
Other fish-liver oils	5,000	4,600	3,700	4,500		
Herring oil	43,000	34,000	67,424	110,828		
Total fish oils	60,000	50,000	81,424	127,728		
Seal oil	5,000	5,500	4,700	5,000		
Sperm oil:						
Antarctic	14,904	20,751	16,874	22,569		
Shore stations	400	672	227	469		
Total sperm oil	14, 304	21,423	17, 101	23,038		
Whale oil:						
Antarctic	123,803	123,946	153, 167	121,898		
Shore stations	600	612	769	649		
Total whale oil	124,403	124,558	153,936	122,547		
TOTAL MARINE OILS	203,707	201,981	257, 161	278, 213		
1/ Forecast						

Table 2 - Norway's Imports of Marine Oils, 1957-1958								
		1958		1957				
Commodity	Metric	1,000	US\$	Metric	1,000	US\$		
·	Tons	Kr.	1,000	Tons	Kr.	1,000		
Whale oil, crude	2, 326	3,798	532	708	921	129		
Sperm & bottlenose oil, crude	589	731	102	1,527	2,624	367		
Herring oil, crude	6,632	8, 352	1, 169	13, 269	19,811	2,773		
High-potency (vitamin A) marine-animal oils	919	5,610	785	1,070	6,466	905		
Cod-liver oil	_	· -	1/	977	1,811	254		
Veterinary fish-liver oil	5	3		134	268	38		
Industrial fish-liver oil	362	512	72	746	1,338	187		
Mixed fish-liver oil	4,186	4,768	668	902	1, 198	168		
Residual fish-liver oil	694	538	75	1,214	1,297	182		
Total	15,713	24, 312	3,403	20,547	35,734	5,003		
1/ Less than US\$500.								
Note: Values converted at rate of 7.143 Kr.=US\$1.								

Table 3 - Norway's Exports of Marine Oils, 1957-1958 1957 1958 1,000 1,000 US\$ Metric UŚ\$ Metric Commodity Kr. 135,911 Kr. 175,709 1,000 1,000 Tons Tons Whale oil, crude!

Sperm & bottlenose oil.

Herring oil, crude

Seal oil, crude

Fish-liver oils.

Refined marine oils, edible

Refined marine oils, other 95,099 19,027 106, 215 24,599 9,771 14,353 19,719 15,940 2,232 2,761 901 307 566 126 240 43 8,145 5,786 810 5,136 4,144 1.140 16,348 2,100 2,569 35,998 4,539 4,847 4,820 17,763 34, 429 5,040 1,661 3, 330 466 635 272 679 1,946 1,252 Marine-animal oils, polymerized, oxidized, etc., 592 1,134 159 948 1,951 273 39,469 77,735 10,883 49,786 111,361 15,590 animal oils, edible Hardened fats from marine -7,503 1,772 934 10, 157 19,325 2,705 animal oils, for technical use. 12,657 Fatty acids from marine oils . . 4,011 4,900 7,726 1,082 6,674 Products from sperm & bottle-4,221 1,462 nose oils....... 10, 126 1,418 4,322 10,446 2, 238 192, 546 4, 465 314, 219 625 1,395 3,056 428 43,990 399,944 55,991 214,213 Total 1/ Including sales made directly from the Antarctic.

Table 4 - Distribution of Norwegian-Produced Antarctic					
Whale Oil, 1957	-1958				
Country	1958	1957			
	(Long	Tons)			
Norway	31,677	54, 255			
West Germany	25,012	23,589			
United Kingdom	30,573	23,052			
Sweden	3,537	1,763			
Denmark	4,993	10,083			
France	12,121	11, 332			
Netherlands	12,460	23, 230			
Belgium-Luxemburg	2,120	3,645			
Total	122,493	151, 447			
Source: "Economic Survey 1958."					

Table 5 - Norway's S	upply and	Distribution	of				
Marine Of	Marine Oils, 1956-1958						
1958 19571/ 19561/							
(Metric Tons)							
Stocks, January 1 72,019 68,410 51,417							
Production	201,981	257, 161	278, 213				
Imports	15,713	20,547	19, 180				
Total supply	289,713	346, 118	348, 810				
Exports	192,546	214, 213	202, 381				
Consumption	52,276	59,886	78,019				
Stocks, December 31	44,891	72,019	68, 410				
Total distribution	289,713	346, 118	348, 810				
1/ Revised.							

Table 6 - Norway's Stocks of Marine Oils, 1954-1958 (as of December 31)								
Product 1958 1957 1956 1955 1954								
	(Metric Tons)							
Crude herring oil								
& whale oil	44,580 71,764 67,981 48,237 47,814							
Othermarine oil.	311 355 439 3,180 1,469							
Total	44,891	72,019	68,410	51,417	49,283			

low the price obtained for the oil produced during the 1956/57 season. The prices varied greatly-about 2,000 tons were sold at L80 (US\$224.80) per long ton; 5,000 long tons at L78 L78 l5s.(US\$219.39); 500 long tons at L70 (US\$196.70; 45,991 long tons at L77 l0s. (US\$216.42); and 68,500 long tons were sold at L67 l0s. (US\$188.41). The total value of the 1957/58 whale oil production was about 176 million kroner (US\$24.6 million) as compared with 256 million kroner (US\$35.8 million) in 1956/57.

Table 7 -	Table 7 - Norway's Exports of Fish Meal, 1957-1958						
Communication		1958			1957		
Country of	Metric	1,000	US\$	Metric	1,000	US\$	
Destination	Tons	Kr.	1,000	Tons	Kr.	1,000	
United States	116	118	17	3,642	3,681	515	
Italy	3,341	3,785	530	2,529	2,992	419	
Switzerland	9,878	10,001	1,400	7,921	8,055	1,128	
Sweden	7,834	8,878	1,243	9,043	10,884	1,524	
West Germany	13,972	15,135	2,119	20,825	23,992	3,359	
Austria	3,706	3,924	549	2,796	3,120	437	
Belgium-Luxemburg	9,578	10,901	1,526	9,695	11,544	1,616	
Denmark	3,860	3,802	532	4, 156	4,204	589	
France	15,864	18, 153	2,541	15,038	17,836	2,497	
Netherlands	11,329	13,096	1,833	17,491	20,850	2,919	
United Kingdom	18,394	21,471	3,006	32, 132	38, 258	5,356	
Israel	1,237	1,478	207	3,469	3,958	558	
Others	6,855	7,998	1,120	5,961	7,239	1,013	
Total	1/105,964	118,738	16,623	2/134,699	156,613	21,925	
1/ Of which 89, 437 tons valued at 103 mi	llion kroner (U	JS\$14.4 mill	ion) were he	erring meal.			
2/ Of which 120,468 tons, valued at 142.	9 million kroi	ner (US\$20 m	illion), wer	e herring mea	1.		

FOREIGN TRADE: Mainly as a result of a substantial reduction in imports of herring oil, total Norwegian imports of all marine oils were reduced from 20,547 tons in 1957 to 15,713 tons in 1958.

Exports of crude and processed marine animal oils were reduced from 214,213 tons in 1957 to 192,546 tons in 1958.

Fish-liver oil exports in 1958 increased somewhat over 1957 exports mainly as a result of a substantial increase in sales to Czechoslovakia, which purchased about 5,100 tons, or close to 30 percent of total Norwegian exports of fish-liver oils.

Exports of crude herring oil were down to 240 tons in 1958 as compared with 566 tons in 1957 and 1,839 tons in 1956 as a result of the low herring oil production. Seal oil exports were 4,144 tons in 1958, or about 20 percent less than in 1957. More than 95 percent of total seal oil exports were sold to West Germany.

Total exports of hardened edible marine oils were 39,500 tons in 1958 as compared with 49,800 tons in 1957. The U.S.S.R. was the main purchaser with 27,000 tons, or about 68 percent of the total exports. In 1957, U.S.S.R. imported 33,000 tons or about 66 percent of Norway's total exports of hardened edible marine oils. As in previous trade agreements between Norway and U.S.S.R., some 30,000 tons of hardened marine fats were included in the agreement for 1959.

DISTRIBUTION AND PRICES: Norwegian production of whale and sperm oil from the 1957/58 Antarctic season was sold, as usual, through the Norwegian whaling companies common marketing pool.

The average price for whale oil in 1958 was £72 (US\$202.32) per long ton, or about 16 percent be-

According to reports, the Norwegian whaling companies have sold about 91,500 long tons of this year's production to a large British firm and to the Norwegian whale oil hardening plant at £72 10s. (US\$202.46) per long ton. In addition, about 9,500 long tons have been sold at prices varying between £74 (US\$207.94) and £75 (US\$210.75). Prices show a slight improvement over the 1958 level.

Sperm oil prices were substantially reduced in 1958 (average price was £65 (US\$182.65 per long ton) or about 22 percent below the prices obtained for the 1956/57 production. Because the sperm oil production was higher in 1957/58 than during 1956/57, the total value declined only from 28 million kroner (US\$3.9 million) to 27 million kroner (US\$3.8 million).

STOCKS: Stocks of marine oils decreased by about 38 percent from 1957 and totaled 44,891 tons at the end of 1958.

CONSUMPTION: According to estimates on the basis of available statistics, the Norwegian consumption of marine oils and products was reduced from about 60,000 tons in 1957 to about 52,300 tons in 1958.

Fish Meal: PRODUCTION: Norway's production of fish meal dropped from about 175,000 tons in 1957 to about 95,000 tons in 1958, as a result of the poor herring catch in 1958. Results from the 1959 herring season indicate that the production of herring and other fish meal will increase somewhat and may reach 115,000 or 120,000 tons.

EXPORTS: Fish meal exports dropped from 134,699 tons in 1957 to 105,964 tons in 1958. The United Kingdom, France, West Germany, and the Netherlands provide the best markets for Norwegian fish meal.

The average export price for fish meal dropped from 1,162 kroner (US\$162.68) per ton in 1957 to about 1,123 kroner (US\$157.22) per ton in 1958.



Pakistan

FISHERIES DEVELOPMENT PROGRAM EXPECTED TO STIMULATE SHRIMP EXPORTS:

Six private trawlers and more than 50 boats fitted with marine Diesel engines are expected to join the present small fishing fleet of 2 modern fishing trawlers and 75 fishing boats during the next fishing season to stimulate Pakistan's frozen and canned shrimp export trade. During four months of operations (December 1958-March 1959), two trawlers which are operated by the Fisheries Department caught 225,232 pounds of shrimp and fish valued at Rs. 125,000 (\$26,250).

Apart from the Government fisheries programs, the Government of Pakistan has recently sanctioned the following



Small fish and shrimp are unloaded from the boat and carried ashore in mat baskets at the fishing village of Ibrahim Hydri, West Pakistan, about 11 miles from Karachi.

fisheries development program under the private sector for implementation within the course of a year at the total cost of about Rs. 12,000,000 (\$2,520,000). Three-fourths of this sum will be available in foreign exchange.

The development program includes the following:

Production: Karachi: carrier vessels 2; mechanized fishing boats 8; shrimp trawler 1. Makran Coast including Gwadur; carrier vessels 1; mechanized fishing boats 4; shrimp trawler 1. West Pakistan: insulated vans 4; insulated boxes 1,000. East Pakistan: fishing launches and boats 4 (Khulna coastal Area 2. Chittagong & Cox's Bazar Area 2); carrier vessels 2 (Khulna Area 1, Chittagong 1); insulated vans 4; shrimp trawler 2 (Khulna Area 1, Chittagong 1); cold storages 4 (one each at Sylhet, Khulna, Rajbari, and Chittagong); ice plants 4 (one each at Sylhet, Khulna, Khopupara, and Goalando).

Fish Industries: Makran Coast: shrimp freezing plants 2, canning plants 2, and fish meal plants 2. East Pakistan: shrimp freezing plants 2, canning plants 2, and fish meal plant 1.

The Pakistan Government will give reasonable assistance to private parties who may wish to take advantage of and participate in this program. Cooperative Societies will be given preferential treatment (Pakistan Affairs, July 1, 1959).



Peru

EXPORTS OF SELECTED MARINE PRODUCTS, JANUARY-MARCH 1958 and 1959:

During the first quarter of this year Peru's exports of selected marine products were up sharply from the same period in 1958. Exports of fish meal in January-March this year of 51,058 metric tons were more than double the

Peruvian Exports of Principal Marine Products, January-March, 1958 & 1959

Product	First Quarter				
Product	1959	1958			
	(Metric Tons).				
Canned bonito	3,540	2,884			
Fish meal	51,058	24,492			
Tuna, frozen	2,976	1,401			
Skipjack, frozen	930	640			
Sperm oil	3,749	2,790			

24,492 tons exported in the same months of last year. The f.o.b. value of fish meal

Peru (Contd.):

exports for the same period rose about 110.7 percent or from US\$2.8 million in 1959.

At the present time there are about 70 fish-meal reduction plants in Peru and further expansion of this industry is expected to raise the production to 180,000 metric tons yearly. Fish-meal consumption in Peru is about 350 tons a month, mostly as a supplement for poultry and hog feeds. The balance of the production is finding a ready market in Europe and the United States.

Fish-meal production in 1958 was estimated at 112,000 metric tons, almost double the production in 1957.



Portugal

CANNED FISH EXPORTS, JANUARY-APRIL 1959:

Exports of canned fish by Portugal during January-April 1959 amounted to 21,755 metric tons (1,201,000 cases), valued at US\$11.2 million, as compared with 17,875 tons, valued at US\$10.0 million, for the same period in 1958. Sardines in olive oil exported during the first 4 months of 1959 amounted to 15,737 tons, valued at US\$7.8 million.

Portuguese Canned Fish Exports, January-April 1959					
Products	January -A				
	Metric	US\$			
	Tons	1,000			
Sardines in olive oil	15,737	7,777			
Sardines & sardinelike fish in brine	673	136			
Tuna & tunalike fish in olive oil	772	558			
Anchovy fillets	2,277	1,597			
Mackerel in olive oil	1,519	746			
Other fish	777	427			
Total	21,755	11,241			

During January-April 1959, the leading canned fish buyer was Germany with 4,913 tons (valued at US\$2.4 million), followed by Italy with 2,880 tons (valued at US\$1.5 million), the United States with 2,049 tons (valued at US\$1.5 million), Belgium-Luxembourg with 1,775 tons (valued at US\$867,000), and Great Britain with 1,736 tons (valued at US\$828,000).

Exports to the United States included 1,037 tons of anchovies, 49 tons of tuna, 919 tons of sardines, and 19 tons of mackerel. (Conservas de Peixe, June 1959).

* * * * *

CANNED FISH PACK, JANUARY-APRIL 1959:

The total pack of canned fish for January-April 1959 amounted to 5,175 metric tons as compared with 5,424 tons for

Portuguese Canned Fish Pack, January-April 1959						
Product	Net Weight	Cases				
	Metric	US\$				
In Olive Oil:	Tons	1,000				
Sardines	2,013	106				
Sardinelike fish	5	_				
Anchovy fillets	2,387	238				
Tuna	341	12				
Mackerel	3	-				
Other Species	426	22				
Total	5, 175	378				

the same period in 1958. Canned sardines in oil (2,013 tons) accounted for 38.9 percent of the total pack in the first four months of 1959, lower by 30.0 percent than the pack of 2,876 tons for the same period of 1958, the June 1959 Conservas de Peixe reports.

* * * * *

FISHERIES TRENDS, JANUARY-APRIL 1959:

Sardine Fishing: During January-April 1959, the Portuguese fishing fleet landed 5,778 metric tons of sardines (valued at US\$554,817 ex-vessel or about US\$96 a ton).

A total of 1,706 tons of sardines (valued at US\$210,052) was landed in April 1959, the bulk being purchased for the local fresh fish market. Very little was canned or salted.

Other Fishing: The January-April 1959 landings of fish other than sardines were principally 8,084 tons of chinchards (value US\$397,530). (Conservas de Peixe, June 1959.)



South-West Africa

PILCHARD-MAASBANKER CATCH QUOTA INCREASED FOR 1959:

For six years, from 1953, the pelagic shoal fish (mostly pilchards) quota for South-West Africa's Walvis Bay area has been fixed and maintained at a steady 250,000 short tons a year. From 1959, however, the annual quota is to be raised slightly from 250,000 to 260,000 tons. During the 1959 season only, the six processing factories at Walvis Bay have been granted an additional quota of 40,000 tons. This raises the pilchard-maasbanker quota in 1959 to 300,000 tons.

The Head of the Fisheries Department said that this increase is a practical measure to include a growing catch of maasbanker or jack mackerel in the quota. Although the Walvis Bay catch consists almost entirely of pilchards, maasbanker do occasionally appear among the fish landed. Two or three years ago those fish accounted for only about 1,000 tons of total landings, but the quantity increased to some 6,000 tons last year. The addition to the quota will allow for this increase and also extend the ceiling to both types of pelagic shoal fish.

The first pilchards caught this season had been brought in about the middle of February. But until the end of March the catch and the condition of the fish were very poor and most of the factories and boats waited for an improvement. This came during April and the season is now well under way. (The South African Shipping News and Fishing Industry Review, May 1959.)



Spain

NORWEGIAN PROPOSAL FOR TUNA FISHING OPERATION OUT OF SPANISH PORT REJECTED:

A Norwegian fishery company's proposal to set up tuna fishing operations using Norwegian fishing vessels based at the port of Ceuta, Spain, was rejected at a recent meeting of the Permanent

Commission of the Economic Section of Spain's National Fisheries Syndicate.

The Norwegian proposal was considered as very important by the Commission, especially in view of the harm caused to Spain's export market in Italy by Japanese competition with Atlantic tuna. The Commission decided that the establishment of a Norwegian tuna fishing base at Ceuta might hinder the economic progress of Spain's tuna fishing industry. (Boletin de Informacion, no. 9, June 1959, Sindicato Nacional de la Pesca, Madrid, Spain.)

Sweden

MARINE OILS AND FISH MEAL-PRODUCTION, FOREIGN TRADE, SUPPLY, AND PRICES, 1957-1959:

Supply: Edible oils derived from fish and whales (51,561 metric tons) made up about 30 percent of Sweden's 1957-1959 average annual supply of all edible vegetable and animal oils and fat (169,756 metric tons). Edible marine oils (used largely for the manufacture of oleomargarine) are practically all imported. Other marine oils (inedible whale and fish oils and fish-liver oils) are primarily of domestic origin.

Imports: During 1958, a total of 26,697 tons of edible whale and fish oil were imported as compared with 41,486 tons in 1957. Inedible whale and fish oil imports dropped from 284 tons in 1957 to 232 tons in 1958; fish-liver oil imports of 1,257 tons in 1958 were up 106 tons from 1957.

Exports: Exports of marine oils by Sweden are largely inedible whale oil. In 1958, 1,788 tons of inedible whale oil were exported, 105 tons less than 1957 exports of 1,893 tons. Only very small quantities of fish-liver oils are exported.

Fish Meal: Sweden's supply of whale and fish meal averaged annually about 17,000 tons for the 1957-1959 period and was made up of 2,500 tons produced in Sweden and the balance of imported fish meal. In both 1958 and 1957 Nor-

Sweden (Contd.):

Table 1 - Sweden's Supply and Distribution of Marine Oils, 1957-1959							
Туре	Opening Stocks, Jan. 1	Produc- tion	Imports	Total Supply	Exports	Domestic Consumption	Ending Stocks, Dec. 31
19591/:							
Whale & fish oils, edible	19,900	- 1	30,000	49,900	~	27,900	22,000
Whale & fish oils, inedible.	2/	3, 200	300	3,700	1,800	1,900	2/
Fish-liveroil, inedible	400	2,400	1,200	4,000	10_	3,590	400
1958:							
Whale Efishoils, edible	23,400	-	26,696	50,096	-	30, 196	19,900
Whale & fish oils, inedible.	2/	3,200	229	3, 429	1,788	1,641	<u>2</u> /
Fish-liver oil, inedible	400	2,300	1,256	3,956	7	3,549	400
1957:							
Whale & fish oils, edible	13,200	-	41,486	54,686	-	31,286	23, 400
Whale Efishoils, inedible .	<u>2</u> /	3,000	285	3,285	1,894	1,391	<u>2</u> /
Fish-liver oil, inedible	400	2,400	1, 152	3,952	110	3,442	400
1/ Estimated.							

Table 2 - Sweden's Supply and Distribution of Whale and Fish Meal, 1957-19591/							
Whale and Fish Meal	Opening Stocks, Jan. 1	Produc- tion	Imports	Total Supply	Exports	Domestic Consumption	Ending Stocks, Dec. 31
	T	(Metric Tons)					
1959	2/	2,500	15,000	17,500	-	17,500	2/
1958		2,500	13,296	15,796	_	15,796	2/
1957	2/	2,500	15,480	17,980	_	17,980	2/
1/Estimated. 2/Unavailable.							

Table 3 - Sweden's Imports of Marine Oils by Country of Origin, 1957-1958						
Country	Fish-Liver Oil		Edible Whale Oil		Inedible Whale Oil	
Country	1958	1957	1958	1957	1958	1957
Norway	1,254	1,074	3,685	2,995	184	235
Denmark	3	20	7,477	5,483	40	21
West Germany	**	15	9,365	9,352	7	28
Argentina	_	_	3,358		-	_
Australia	-	-	1,112	1,936	-	-
United Kingdom	_	_		514	-	-
Japan	-	3	-	4,973	-	-
Iceland	_	39	1,700	4,825	-	-
United States	-		-	11,408	1	
Total	1,257	1,151	26,697	41,486	232	284

Table 4 - Sweden's Exports of Marine Oils by Country of Destination, 1957-1958					
Country	Fish-L	iver Oil	Inedible Whale Oil		
Country	1958	1957	1958	1957	
	(Metric Tons)				
West Germany.	7	110	230	292	
Norway	-	-	1,058	947	
Denmark		_	477	632	
Austria		-	20	20	
Other	-	-		2	
Total	7	110	1,788	1,893	

Table 5 - Sweden's Imports of Fish Meal by Country of Origin, 1957-1958					
Country 1958 1957					
(Metric Tons)					
Denmark	531	504			
Iceland	3,080	4,024			
Norway	7,860	8,514			
Total	11,471	13,042			

way was the principal supplier of fish meal to Sweden, followed by Iceland and Denmark.

Import and Regulation Taxes: Although all types of oil seed, fats and oils, oil

cakes and meal may enter Sweden free of duty, import and regulation taxes are levied at changing rates on those products. In lieu of tariffs, an import tax of 39 kroner per 100 kilograms (about 3.4 U. S. cents a pound) except for stearine which is 46.35 kroner per 100 kilograms (4.1 U. S. cents a pound) is levied. The regulation tax is about 50 kroner per 100 kilograms (about 4.8 U.S. cents a pound). The purpose of the import and regulation taxes is to protect the domestic butter industry and the producers of oil seeds. Regulation taxes are also applied to fats and oils derived from seed produced in Sweden. Products of the food industries containing fats will also be subject to import and regulation taxes on the basis of the fat content. But the Swedish processors of fats and oils for soap, paints, and other industrial Sweden (Contd.):

products received rebates for import and regulation taxes.

D 1	Kroner	US\$ Per	
Product	Per Kilogram	Metric Ton	
Whale oil,			
hydrogenated, raw	2.30	443.90	
Whale oil,			
hydrogenated, refined	2.44	470.92	
Whale oil fatty acids	1.55	299.15	
Whale oil fatty acids			
distilled & hydrogenated .	1.75	337.75	

I/ Prices are in metric-ton lots for delivery in tank cars c.i.f buyers' nearest port and include import and regulation taxes at 0.89 kroner per kilogram (7.8 U. S.

cents a pound).

Effective September 1, 1959, a modified price and market program will become effective. The principal change will be that no limit will be set for the import tax. This program will be in effect for six years.



Trinidad

JAPANESE TRAWLER TO EXPLORE FOR SHRIMP OFF COAST:

Early in July 1959, the Japanese vessel Genei Maru (180 tons), owned by a Japanese fishery firm and jointly sponsored by two other firms, sailed for Trinidad. It was expected that when the vessel arrived at its Trinidad base, it would trawl for shrimp for about two months in order to determine whether or not it would be economically worthwhile.



Uganda

LAKE FISHERIES THRIVE DESPITE MASS MORTALITY DISASTERS:

Despite natural disasters which kill vast numbers of fish, the Uganda Lakes are now supporting a thriving commercial fishery, reports a fisheries biologist in the California Department of Fish and Game who has just returned from an assignment in Uganda on behalf of the Food and Agriculture Organization (FAO), Rome, Italy.

"I think, though, that the commercial fish catch at Lake George is now near to

the maximum that can be maintained without injury to the stocks," the biologist reports. "Last year, for example, some 5,000,000 tilapia were taken by the fishermen. They also took, of course, great quantities of other commercial species, such as catfish."

The California biologist, who continued the work of another FAO expert, has been engaged in trying to find out how much the Uganda lake fisheries can be exploited. He has been doing this through tagging and experimental fishing with various kinds of nets.



In 1958 under FAO a United States marine biologist with a native team of nine assistants evaluated the fisheries resources of Lake George, Uganda. Nets were tied systematically at representative spots in the lake. Here one of the gill nets is being pulled into the boat. The fish caught were sorted by species, counted, and weighed, which made it possible to make an estimate of the fish resources of the lake.

"I think we have reached the stage where, by using the Beverton-Holt method of stock assessment, we can determine the extent to which these lakes can be fished without damage to the stocks," points out the biologist. "But before we can arrive at a conclusion, the data we have gathered must be thoroughly analyzed. The answer will show whether or not my suspicion that the present rate of fishing is near the maximum is correct."

Referring to the extensive mortality of fish due to natural phenomena, he

Uganda (Contd.):

explained that such disasters follow a period of hot weather and take place in water which is sheltered from the wind. The area in Lake George where these disasters take place lies under the lee of a high escarpment. The water is protected from the wind and during hot weather the growth of algae builds up, then perhaps just before dawn when oxygen demand is highest, a violent thunderstorm breaks which stirs up the algae and the bottom sediment. The algae absorb the oxygen in the water, which has become thick and muddy, and the fish are suffocated. It was estimated that some 450,000 tilapia were killed the last time this phenomenon took place. Unfortunately, the disaster seems to strike the most mature of the fish and thousands of tilapia weighing as much as $1\frac{3}{4}$ pounds were killed.

The fishermen on the Lake are able to reap a good harvest of catfish when a natural mass mortality of tilapia occurs since the tilapia do not rise until they are spoiling. The first intimation of the last disaster was when the fishermen landed ten times as many catfish as they normally do. The day of the disaster they took, for instance, 2,700 catfish to the fishing station and probably they collected thousands more for their own consumption while, in addition, many thousands of other catfish must have died at the time.

The interesting point about these disasters, which apparently occur every year, perhaps more than once a year, is that they do not appear to affect the viability of the stocks. Indded, in the days following the last disaster more fish were caught in the gill nets and then, about a week later, the catch reverted to normal.



Union of South Africa

UNION AND SOUTH-WEST AFRICA PILCHARD-MAASBANKER FISHERY TRENDS, JULY 1959:

Both the Union of South Africa and South-West Africa are reported to be having a very successful pelagic (mostly pilchards, maasbanker or jack mackerel, or mackerel) fishing season this year. Landings from the pilchard-maasbanker fishery in the Union as of June 30, 1959, amounted to 221,646 metric tons. In addition, 36,425 tons of mackerel had been landed. The 250,000-ton annual quota for pilchards and maasbanker in the Union is expected to be filled long before August 31 and the season is expected to be declared ended by Union fishery officials by the end of August as was the case in 1958.

The South-West African Administration announced about the middle of July that the pilchard-maasbanker quota for this year would be 300,000 tons, an increase of 50,000 tons over 1958. There seems to be little doubt that this increased catch quota can be attained this year. The decision to raise the South-West Africa quota this year was attributed to increases in the proportion of maasbankers in the combined pilchard-maasbanker catch plus an improvement in the size and age of the pilchards in the catches of this species this year, and a desire to meet increasing competition from the Peruvian fish meal in world markets. Production of fish meal by Peru is expected to increase sharply in 1959. In 1958, South-West Africa produced 46,200 tons of fish meal, according to a dispatch of July 24, from the United States Consulate in Cape Town.



U.S.S.R.

MORE FACTORY
TRAWLERS FROM WEST
GERMANY UNDER CONSIDERATION:

The Soviet Union expressed interest to West German authorities for an additional 16 to 18 large factory trawlers, according to Dansk Fiskeritidende (July 3, 1959), a Danish fishery trade periodical. It is reported from Bonn that such a large order would be divided among a number of shipyards if the Russian desires for credit and financing (involving a postponement of payment for 5 to 7 years) could be met. West Germany's largest shipyard built 24 trawlers of the

U.S.S.R. (Contd.):

"Pushkin" type, each measuring 2,450 gross tons, for Russia in 1956 and 1957.



United Kingdom

BRITISH FIRM COMPETES WITH U. S. BUYERS FOR AUSTRALIAN SUPPLIES OF SPINY LOBSTER TAILS:

A large Grimsby, England, fishing and marketing firm has entered the Western Australia market to buy spiny lobster tails in competition with United States buyers. The Grimsby firm, which requires large quantities of spiny lobster tails for marketing in England, has also purchased an established Australian company. The former owner of the Australian firm, who is now a director of the British firm, was in Perth, Australia, in June to negotiate the purchase of spiny lobster tails. The director stated that a new market had been opened in Britain for spiny lobsters and large purchases were being negotiated. He also stated that negotiations were started to sell British frozen fish in West Australia. At present West Australia does not permit the sale of 14-oz, packages of frozen fish, which are standard in England. The help of the British Trade Commissioner's office in Perth is being sought to lift the restriction.

* * * * *

FISHERY LOANS INTEREST RATES LOWERED:

The British White Fish Authority rates of interest were changed on loans as of June 10, 1959. The new rates do not apply, however, where the final installment of a loan or interim installments in current cases were paid by the Authority before June 10, 1959. The other terms and conditions of the Authority's arrangements for loans are unchanged.

The new rates are: on loans for not more than 5 years, $4\frac{3}{4}$ percent; on loans for more than 5 years but not more than 10 years, 5 percent; on loans for more than 10 years but not more than 15 years, $5\frac{5}{8}$ percent; and on loans for more than 15 years, $5\frac{7}{8}$ percent.

The Authority's loans are connected with the building of new fishing vessels of not more than 140 feet; the purchase, in certain circumstances, of new engines and nets and gear for inshore vessels; the construction and equipment of processing plants; and the formation and development of cooperative organizations. (Fish Trades Gazette, June 20, 1959.)



Venezuela

JAPANESE TUNA VESSELS BEGIN FISHING FOR VENEZUELAN FIRM:

Two Japanese tuna long-liners (the No. 3 and No. 5 Boso Marus, 87-grosston boats) sailed from Japan in May under a joint operating agreement between the Chiba Prefecture Fisheries Promotion Company and Venezuelan interests. The new firm in Venezuela will operate a cannery and the two Japanese vessels will supply the raw tuna.

The vessels are now reported to have arrived in Venezuela and begun fishing out of Cumana. The joint enterprise is capitalized at 122 million yen (US\$339,000), of which the Japanese partners have put up 49.7 million yen (US\$138,000). The company will engage principally in tuna fishing, with a planned annual production of about 140 million yen (US\$389,000). (Suisan Keizai Shimbun, July 7, 1959.)



Viet-Nam

BIDS FOR FISH COLD STORAGE AND ICE-MAKING PLANTS REQUESTED:

The Viet-Nam Central Purchasing Agency has called for bids on providing eight fish storage plants, each capable of making 10 metric tons of ice per day and storing 22 short tons of fish. These are to be constructed as part of fish distribution facilities, including landing stages and market facilities, at Go Cong, Cap St. Jacques, Ham Tan, Phan Thiet, Nha Trang, Tuy Hoa, Qui Nhon, and Tourane (Da Nang).

It is expected that all of the installations (a United States Overseas Mission

Viet-Nam (Contd.):

project) will be completed early in 1960. When the installations are completed, they should give considerable aid to commercial fishing in this country. Estimated cost, including the expenses of an engineer to oversee construction and initial operation of the ice plants, is expected to be in the neighborhood of US\$410,000, the United States Embassy in Saigon reported on August 6, 1959.



FISH AND EGGS - A GOOD COMBINATION

The home economists of the Department's Bureau of Commercial Fisheries have developed these special kitchen-tested rec-

BAKED FILLETS WITH PUFFY CHEESE SAUCE

ipes, combining fish and eggs:

2 pounds fillets, fresh or frozen cup mayonnaise or salad dressing 1 tablespoon chopped sweet pickle or pickle relish

1/4 cup grated cheese 2 egg yolks, beaten

Thaw frozen 2 egg whites, beaten fillets. Cut into serving-size por-

tions. Place in a single layer in a well-greased baking pan, 13 x 8 x 2 inches. Combine mayonnaise, sweet pickle, cheese, and egg yolk. Fold in egg white. Cover fish with the sauce. Bake in a moderate oven, 350°F., for 30 minutes or until fish flakes easily when tested with a fork and the sauce is brown. Serves 6.

Remove any shell or cartilage from crab meat. Fry bacon until lightly brown. Add onion and cook until ten- 1 pound crab meat der. Combine eggs, milk, seasonings, \(\frac{1}{4}\) cup chopped bacon and crab meat. Add to onion mixture \(\frac{1}{4}\) cup chopped onion and cook until eggs are firm, stirring 4 eggs, beaten occasionally. Serve on toast points. Serves 6.

SCRAMBLED CRAB AND EGGS

stantly. Add Worces-

tershire sauce, cheese, and tuna; continue heat-

ing until cheese melts.

Stir a little of the hot

1 cup milk teaspoon salt Dash pepper Toast points

Drain tuna. Flake. Melt butter; blend in flour and seasonings. Add milk gradually and cook until thick and smooth, stirring con-

TUNA SOUFFLE

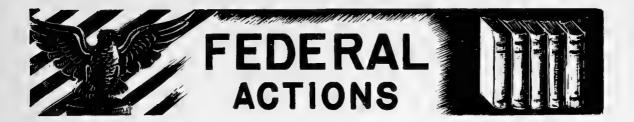
1 can $(6\frac{1}{2})$ or 7 ounces tuna | 1/4 cup butter or other fat $\frac{1}{4}$ cup flour 1 teaspoon salt

Dash pepper

1 cup milk 1 teaspoon Worcestershire sauce cup grated cheese 6 egg yolks, beaten

sauce into egg yolk; add to remaining sauce, stirring constantly. 6 egg whites, beaten Fold into egg white.

Pour into a well-greased, 2-quart casserole. Bake in a moderate oven, 350° F., for 45 minutes or until souffle is firm in the center. Serves 6.



Committee for Reciprocity Information

UNITED STATES AND CUBA TO RENEGOTIATE TARIFFS ON FISHERY ITEMS:

The United States and Cuba are preparing to renegotiate a number of tariff rates applicable to imports into Cuba. Among these imports are the following fishery commodities on which the United States has obtained concessions in previous trade agreement negotiations:

	Present Concession Rate			
Commodity	U.S. cents per	U.S. cents 1/		
•	kilogram	per lb.		
Fish or shellfish canned				
in oil or in any other				
form, in tins or other				
containers:				
Sardines (not boned)				
in tomato sauce or				
oil, of common or				
ordinary class	2.4	1.1		
Salmon	3.9	1.8		
Mackerel	2.8	1.3		
Other fish or shellfish				
not specifically				
classified	$\frac{2}{0.5}$	2/2.3		
Oysters of all kinds, and				
dried or fresh shellfish .	4	1.8		
Feed for fowls, includ-				
ing inter alia compo-				
sitions of animal sub-				
stances with or with-				
out other substances				
finely ground, and				
oyster shells crushed				
for the same purpose	1.2	0.5		
Other feeds for animals,				
notspecifically classi-				
fied	2.6	1.2		
1/ Calculated to nearest tenth of one cent.				
2/ Plus 7 percent ad valorem.				

Public hearings were due to be held, starting September 15, 1959, before the Committee for Reciprocity Information to prepare for (United States) participation in the forthcoming negotiations. The Committee is an (United States) interagency group which receives the views of interested persons on proposed or existing trade agreements.

In preparation for the negotiations, the Committee requested views from

interested persons on the possible effect on (United States) trade of withdrawal or upward adjustment of concessions previously granted by Cuba under the General Agreement on Tariffs and Trade (GATT). The Committee also invited views regarding other concessions which the United States might seek from Cuba as compensation.

The Cuban Government acted under provisions of Article XXVII of the General Agreement, whereby a contracting party wishing to withdraw or modify concessions in its schedule may enter into negotiations for that purpose. The revision of its customs tariff has been under consideration by the Cuban Government for several years. Early in 1958, it put into effect new nomenclature and rates of duty for imports from countries with which it does not have trade agreements or other commercial arrangements. Pending the completion of the present renegotiations, the existing nomenclature and rates will continue in effect.



Federal Trade Commission

CONSENT ORDER PROHIBITS CALIFORNIA CANNED FISH PACKER FROM PAYING ILLEGAL DISCOUNTS:

The Federal Trade Commission (FTC) on August 21, 1959, ordered (Consent Order 7438 Food Products) a San Francisco, Calif., canned fish packer to stop granting illegal discounts or allowances in lieu of brokerage.

The Commission affirmed the Hearing Examiner's, June 16, 1959 order, which had been agreed to by both the company and the FTC's Bureau of Litigation.

The FTC's complaint of March 12, 1959, had charged that the company, which processes and sells canned fish, fruit, and vegetables, gave to customers buying directly from it commission payments, discounts, or other allowances reflecting the $2\frac{1}{2}$ percent fee it normally must pay brokers for negotiating sales of its products. The granting of payments or discounts in lieu of brokerage is prohibited by Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act. The order forbids such illegal payments in the future.

The agreement is for settlement purposes only and does not constitute an admission by the company that it has violated the law.

Department of the Interior

FISH AND WILDLIFE SERVICE

PROPOSED INCREASES IN RAILWAY EXPRESS RATES PROTESTED BY INTERIOR DEPARTMENT:

The Railway Express Agency has filed tariffs to increase most less-than-carload express rates to become effective September 1, 1959. The amounts of the increases are (1) 35 cents per hundred pounds between points within the Eastern territory and between points within the Mountain Pacific territory, minimum of 35 cents per shipment, and (2) 25 cents per hundred pounds, 25 cents minimum per shipment, between all other points.

The U.S. Department of the Interior has petitioned the Interstate Commerce



Commission for suspension of the operation of the schedules and to institute an investigation as to the lawfulness of the schedules.

The Department's petition for suspension follows:

"BEFORE THE INTERSTATE COMMERCE COMMISSION PETITION FOR SUSPENSION

"COME NOW the United States Department of the Interior, which is required by the Agricultural Marketing Act of 1946, as amended (7 U.S.C. 1621-27), and pursuant to the Fish and Wildlife Act of 1956 (16 U.S.C. 742e) and Bureau of the Budget determination (23 FR 2304, 3/22/58) to assist the fishing industry in the "improvement of transportation facilities and rates for fish and shellfish and any products thereof," and respectfully submits this petition for investigation and suspension.

"Many of the increases provided in the tariffs referred to above obviously will cause increased costs to the fishing industry for shipments of its products via Railway Express. The fishing industry is experiencing economic difficulties and there is some question if it can bear this increase in costs. Furthermore, the above referenced tariff increases will be borne more heavily, percentagewise, on the shipments where the rates are low as compared to those that are higher. There is some question as to the economic justification of this type of increase.

"For reasons heretofore stated, the Department of the Interior respectfully requests the Interstate Commerce Commission to suspend the operation of the above referenced schedules and to institute an investigation as to the lawfulness of the schedules.

"It is further requested that the Commission's Board of Suspension give notification of the decision voted by Division II and the minute entered by it relative to this protest (such as can be given by telephone in lieu of telegraph - Code 183, Extensions 4796 or 2287).

Respectfully submitted,

/S/Fred A. Seaton Secretary of the Interior"

Others who also petitioned for suspension of increased rates are: the National Fisheries Institute, American Retail Federation, California Grape and Tree Fruit League, Gift Shippers Association, International Apple Association, Inc., M. L. Todd Company, Inc., Public Utility Commissioner of Oregon, Rufus Schmur & Sons, Inc., Society of American Florists and Ornamental Horticulturists, Charles S. Stevenson, Texas Citrus & Vegetable Growers & Shippers, U. S. Department of Agriculture, and General Services Administration.

* * * * *

WHALING REGULATIONS AMENDED:

The whaling regulations, applicable to nationals and whaling enterprises of the United States, were amended in accordance with the changes made by the International Whaling Commission on October 6, 1958, and January 29, 1959. The amendments as they appeared in the July 14 Federal Register follow:

Chapter III—International Regulatory | tenth meeting, at The Hague, 1958, be-Agencies (Fishing and Whaling)

SUBCHAPTER B-INTERNATIONAL WHALING COMMISSION

PART 351--WHALING

Basis and purpose. Section 13 of the Whaling Convention Act of 1949 (64 Stat. 421, 425; 16 U.S.C., 1952 ed., 916k), the legislation implementing the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946, by the United States of America and certain other Governments, provides that regulations of the International Whaling Commission shall be submitted for publication in the FEDERAL REGISTER by the Secretary of the Interior. Regulations of the Commission are defined to mean the whaling regulations in the schedule annexed to and constituting a part of the Convention in their original form or as modified, revised, or amended by the Commission. The provisions of the whaling regulations, as originally embodied in the schedule annexed to the Convention, have been amended several times by the International Whaling Commission. The whaling regulations, as last amended by the Commission in October 1957 were edited to conform in numbering, internal references, and similar items to regulations of the Administrative Committee of the Federal Register and were published in their entirety as Part 351, Title 50, Code of Federal Regulations, without change in the substantive provisions (23 F.R. 3063, May 8, 1958).

On October 6, 1958, and January 29, 1959, amendments to the whaling regulations made by the Commission at its Note: Also see Commercial Fisheries Review, August 1958, p. 88.

came effective. Since these amendments effect only minor changes in the regulations as published on May 8, 1958, republication of the regulations in their entirely is not necessary. fore, publication is made at this time of the changes in the regulations accomplished by the Commission amendments which came into operation on October 6, 1958, and January 29, 1959.

The provisions of the whaling regulations are applicable to nationals and whaling enterprises of the United States.

Amendments to the whaling regulations are adopted by the International Whaling Commission pursuant to Article V of the Convention without regard to the notice and public procedure requirements of the Administrative Procedure Act (5 U.S.C. 1001). Accordingly, in fulfillment of the duty imposed upon the Secretary of the Interior by section 13 of the Whaling Convention Act of 1949, the whaling regulations published as Part 351, Title 50, Code of Federal Regulations, as the same appeared in 23 F.R. 3063, May 8, 1958, are amended as set forth below.

Dated: July 7, 1959.

FRED A. SEATON, Secretary of the Interior.

- 1. Paragraphs (a) and (b) of § 351.6 are amended to read as follows:
- § 351.6 Limitations on the taking of humpback whales.
- (a) It is forbidden to kill or attempt to kill humpback whales in the North Atlantic Ocean for a period ending on November 8, 1964.

(b) It is forbidden to kill or attempt to kill humpback whales in the waters south of 40° South Latitude between 0° Longitude and 60° West Longitude for a period ending on November 8, 1964.

2. The proviso to paragraph (a) of § 351.8 is amended to read as follows: "Provided, That in the season 1958-59, the number of baleen whales taken as aforesaid shall not exceed fourteen five hundred blue whale thousand units." 1

3. The proviso to paragraph (c) of § 351.8 is amended to read as follows: "Provided, That when the number of blue whale units is deemed by the Bureau of International Whaling Statistics to have reached 13,500 (but 13,000 in the season 1958-59) notification shall be given as aforesaid at the end of each day of data on the number of blue whale units taken." 2

(Art. V, 62 Stat. 1718)

The proviso to paragraph (a) of § 351.8 reflects a restriction on the taking of blue whale units as amended by the International Whaling Commission at its Tenth Meeting, at The Hague, 1958, which came into opera-tion on January 29, 1959. The amendment was objected to by Norway, the Netherlands, the United Kingdom, Japan, and the U.S.S.R. within the prescribed period, and the amendment, therefore, is not binding on those countries.

² The proviso to paragraph (c) of § 351.8 reflects a restriction on the taking of blue whale units as amended by the International Whaling Commission at its Tenth Meeting, Whating Commission at its I-tal Microsia, at The Hague, 1958, which came into operation on January 29, 1959. The amendment was objected to by Norway, the Netherlands, the United Kingdom, Japan, and the U.S.S.R. within the prescribed period, and the amendment, therefore, is not binding on those countries.



Treasury Department

UNITED STATES CUSTOMS COURT

IMPORTED FISH FILLET BLOCKS IN BULK HELD DUTIABLE AT ONE CENT A POUND:

A recent decision (C.D. 2101) by the United States Customs Court held that fish fillet blocks imported in bulk are dutiable at one cent a pound. The case was the result of protests against the decision of the collector of customs at the port of New York that fish fillet blocks in bulk were dutiable at $2\frac{1}{2}$ cents a pound (or $1\frac{7}{8}$ cents a pound if imported within the quota). Judgement for the plaintiff was rendered July 15, 1959. The decision as reported in the July 23, 1959, issue of Treasury Decisions follows:

(C.D. 2101)

THE LEE HERRMANN Co., A/C THE COLDWATER SEAFOOD CORP. v. UNITED STATES

Fish, fresh or frozen, filleted, skinned, boned, sliced or divided into portions, not specially provided for-Fish, prepared or preserved, not specially provided for

Certain merchandise described as "haddock blocks" and "cod blocks" held properly dutiable at the rate of 1 cent per pound under paragraph 720(b), Tariff Act of 1930, as modified, as "Fish, prepared or preserved, not specially provided for: * * * In bulk or in immediate containers, weighing with their contents more than fifteen pounds each," as claimed, rather than classifiable at the rate of 2½ cents per pound under paragraph 717(b) of the said act as "Fish, fresh or frozen • • • filleted, skinned, boned, sliced, or divided into portions, not specially provided for."

The record discloses that the fish blocks in question, unlike fillets of frozen and fresh fish, are not composed of whole pieces of fish but comprise various pieces of fish together with bits and trimmings, in block form, and that they are not sold for direct consumption as imported, but are only used for further processing into fish sticks or fish portions. The imported merchandise is not fish "filleted," "akinned," "boned," "sliced," or fish "divided into portions."

The case of Iceland Products, Inc., and D. J. Ambrosio v. United States, 38. Cust. Ct. 526, Abstract 60817, cited with approval.

United States Customs Court, First Division

Protests 317349-K and 317373-K against the decision of the collector of customs at the port of New York

[Judgment for plaintiff.]

(Decided July 15, 1959)

Barnes, Richardson & Colburn (Joseph Schwarts of counsel) for the plaintiff. George Cochran Doub, Assistant Attorney General (Murray Sklaroff, trial attorney), for the defendant.

Before Oliver, Mollison, and Wilson, Judges

Wilson, Judge: The merchandise at bar, described as "haddock blocks" and "cod blocks," was classified for duty at the rate of 2½ cents per pound under the provisions of paragraph 717(b) of the Tariff Act of 1930 for "Fish, fresh or frozen * * * filleted, skinned, boned, sliced, or divided into portions, not specially provided for." It appears that the fish blocks in question were advisorily classified by the examiner as "fillets" (R. 75). Plaintiff claims the merchandise properly classifiable at the rate of 1 cent per pound under paragraph 720(b) of the act, as modified by the General Agreement on Tariffs and Trade, T.D. 51802, as "Fish, prepared or preserved, not specially provided for: * * * In bulk or in immediate containers, weighing with their contents more than fifteen pounds each."

Two sizes of fish blocks are described on the invoices herein: 12-pound and 22½-pound size, packed in corrugated paper containers. The 12-pound blocks are packed 5 blocks to each container, and the 22½-pound blocks are packed 3 blocks to a container.

A 12-pound block of fish illustrative of the imported merchandise, together with photographic representations of the items, was received in evidence as plaintiff's illustrative exhibit 1 and collective illustrative exhibit 2, respectively (R. 10-11). A package of fish offered as illustrative of "fish fillets" was received in evidence as plaintiff's illustrative exhibit 3 (R. 17). A photograph of a thawed-out 10-pound block of fish imported by the plaintiff herein, not, however, from the importation at bar, was received in evidence as defendant's illustrative exhibit A (R. 71).

Jon Gunnarsson, president of The Coldwater Seafood Corp., testified that his company imports seafood, including fish fillets and fish blocks, such as "cod blocks" and "haddock blocks," and various other types of fish. The witness described the production of fish blocks such as plaintiff's illustrative exhibit 1 as follows:

- A. The flesh from the cod, for instance, is cut from the fish. The skin is taken away from the flesh, and the bones are removed, and there is a steel frame of this rectangular shape and size, correct size, to make the block, and also have the correct height of the steel frame. Then this flesh of the fish is thrown into the steel frame, and the length of the fish flesh is parallel to the width of the block, and then the small bits and trimmings are put into it to fill out where there are any volds between the whole pieces, and then all this is pressed together in a plate freezer under considerable pressure, more than any other fillets, in order to make it a compact mass of this fish flesh.
- Q. You said the spaces, or some word to that effect, were filled with bits and trimmings?—A. Yes.
- Q. Will you tell us why that is done?—A. In order to make it compact, so that when it is cut up for fishsticks production, that there are not any air spaces in the mass of fish. [R. 12.]

Mr. Gunnarsson explained the difference in production and use of the fish block (plaintiff's illustrative exhibit 1) and fillets (plaintiff's illustrative exhibit 3) as follows:

THE WITNESS: In this Illustrative Exhibit 1, we use fish of all sizes and pleces, and also trimmings, in order to make it a compact mass, and it is pressed very firmly together in order to avoid any air space being inside, and it is used for processing, for processing, as I said, of fish sticks and portions, and then it is marketed, whereas the fillets in Illustrative Exhibit 3, they are whole fillets, cleanly cut, ready for the consuming public, and this particular pack of fillets is used here in this country for the catering trade. [R. 18-19.]

In the fish blocks, the fillets removed from the fish are not trimmed in any way. Any loose meat around the edges is left intact and the napes that are taken from the fillets are put into the block. Before pressing, all the open spots are filled with loose pieces and trimmings to make one compact mass, and the material is pressed together to make the fish block. Usually, the fish block contains about 10 per centum of small bits and trimmings. (R. 26–27.)

The testimony of the witness Gunnarsson to the effect that these fish blocks were cut into portions or sticks and further processed by breading and cooking, but that the fillets (plaintiff's illustrative exhibit 3), are sold in the same condition and in the same containers as when purchased, without any further processing, was confirmed by that of plaintiff's remaining witnesses (R. 42; 53). Plaintiff's witnesses, all of whom had dealt in merchandise, such as that at bar, as well as in fish "filleted," "skinned," "boned," "sliced," or "divided into portions," further testified that the fish block, plaintiff's illustrative exhibit 1, is not included within any of the latter terms, because it is not used for the same purpose as the items mentioned (R. 21; R. 64); that the merchandise represented by plaintiff's illustrative exhibit 1 would not be accepted as a good delivery of an order for fish "filleted," "skinned," "boned," "sliced," or "divided into portions" (R. 21; R. 50; R. 64); that the fish blocks under consideration are never thawed

out for the purpose of obtaining fillets for sale (R. 22-23; R. 38; R. 67).

The Government's only witness was the examiner of the merchandise under consideration, who testified that he took a 10-pound cod block, consisting of bits of boneless and skinless fish, from a different importation by the same importer herein but produced by the same producer of the mecrhandise before the court, and that he had such block thawed out and photographed (defendant's illustrative exhibit A). Defendant's witness was unable to state the size of the pieces shown in defendant's illustrative exhibit A. In this connection, the record discloses the following colloquy:

CHIEF JUDGE OLIVER: Is it fair for us to assume, looking at this photograph, Illustrative Exhibit A, that there were no small pieces in that block at all to fill in anything?

THE WITNESS: That is everything that was in that block.

CHIEF JUDGE OLIVER: Looking at the photograph, am I safe in saying there are no pieces in there, just these large pieces you show in the photograph?

THE WITNESS: Exactly.

JUDGE WILSON: Would you say there are no small pieces in that block, Illustrative Exhibit 1?

THE WITNESS: I couldn't say unless it was thawed, or nor can anybody else say. [R. 72.]

While defendant's witness insisted that if there were any small pieces adhering to the larger pieces, they would show up on the photograph, illustrative exhibit A, he agreed, however, that when a block, such as plaintiff's illustrative exhibit 1, is produced, it resuks in a quantity of fish "pressed together into a cohesive mass with some of the fibers of the fish becoming intertwined with each other." (R. 73.)

It is the position of the Government in the case at bar that the fish flesh comprising the fish blocks in question consists of filleted or skinned or boned fish, within the common meaning of those terms, and that, as a matter of law, freezing such fish in block form did not remove them from the provisions of paragraph 717(b) of the act under which the involved merchandise was classified.

Plaintiff, in its brief, argues that this case is controlled by the holding of the court in Iceland Products, Inc., and D. J. Ambrosio v. United States, 38 Cust. Ct. 526, Abstract 60817, involving the same "classification" and "claim" as here involved. In the above case, the loose flesh and trimmings obtained as a byproduct in processing "fillets" were placed in stainless steel or monel containers and were then packed in molds to make a 7-pound block. The fresh "block" was wrapped with parchment paper and, still in this form, was put into plate freezers and then quickfrozen. After it was quickfrozen, it was removed from the form and given a "glaze bath," i.e., the frozen block was submerged quickly in a bath of a weak salt brine which froze it immediately and formed an ice glaze, the purpose being to seal against dehydration. Then, these 7-pound blocks were massed in 8 blocks to the case.

The court, in the *Iceland Products* case, supra, in holding the involved blocks properly dutiable under paragraph 720 (b) of the Tariff Act of 1930, as modified, supra, as "Fish, prepared or preserved, not specially provided for: * * In bulk or in immediate containers weighing with their contents more than fifteen pounds each," at the rate of 1 cent per pound, as claimed, stated, page 527:

• • • All the fillets of frozen and fresh fish described in paragraph 717 are sold directly to the consuming public, as packed and in the condition as imported. On the other hand, the "Fish Bits" imported in the 7-pound frozen blocks, hereinefore described, are never sold for direct consumption, as imported, but find a market only with companies who process the fish bits into fish flakes or fish cakes. And, at page 528:

• • • • We agree with the statement in plaintiffs' brief that "Fish Bits" are not made up of a solid piece. "Instead they are made of loose pieces, irregular in shape and size. No particular fish can be identified when the fish bits are in block form."

We are of opinion that the situation in the Iceland Products case, supra, parallels that in the case at bar and that the holding therein is decisive of the present issue. The testimony in this case also shows that the involved fish blocks are composed of fish of various sizes and loose pieces and trimmings and that they are only used by the processing trade and never sold for direct consumption as imported, whereas the "fillets" (plaintiff's illustrative exhibit 3) are whole fillets, cleanly cut, ready for the consuming public without further processing. In the Summary of Tariff Information 1929, relative to merchandise covered by paragraph 717(b) of the Tariff Act of 1930, we find, at page 1140, under the heading of "All Other Fish, Skinned or Boned, in Bulk, or in Immediate Containers Weighing With Their Content More Than 15 Pounds Each":

Description and uses .- * *

Fillets are prepared from the whole fish by removing the head and entrails and cutting along each side of the skeleton to produce two pieces of fiesh. Some fillets are further processed by removing the skin. The product is either shipped fresh for immediate consumption, frozen and held in storage for subsequent use, or smoked. • • • •

It further appears from the record herein that the fish block in question, as imported, would not be accepted as a good delivery of an order for fish "filleted," "skinned," "boned," "sliced," or "divided into portions." Of similar import is the testimony of plaintiff's witnesses that, from a commercial standpoint, fish blocks, such as those in question, are never "thawed out" to obtain fish fillets or any of the other varieties of fish enumerated under the paragraph of the act (paragraph 717(b)) under which the involved merchandise was classified. This testimony stands uncontradicted. The fact that the fish blocks in the Iceland Products case, supra, were composed of scraps and bits of material obtained in trimming fillets, whereas, in the case at bar, the involved fish blocks are composed of large pieces of skinless and boneless fish to which are added loose pieces and trimmings, does not, in our opinion, call for a different determination than that here found. The witness who here testified on behalf of the Government agreed that when a block, such as plaintiff's illustrative exhibit 1, is produced. it results in a quantity of fish "pressed together into a cohesive mass with some of the fibers of the fish becoming intertwined with each other" (R. 73). Accordingly, in its condition as imported, the merchandise represented by plaintiff's illustrative exhibit 1 is not fish "filleted," "skinned," "boned," "sliced," or "divided into portions," having lost its identity as such. It has reached a condition beyond the latter stages and is marketable in such condition for further

On the record presented, we hold the involved merchandise properly dutiable at the rate of 1 cent per pound under paragraph 720(b) of the Tariff Act of 1930, as modified by the General Agreement on Tariffs and Trade, T.D. 51802, as "Fish, prepared or preserved, not specially provided for: * * * In bulk or in immediate containers, weighing with their contents more than fifteen pounds each," as claimed. The protests are sustained.

Judgment will issue accordingly.



Eighty-Sixth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries



and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and

Senate, as well as signature into law or other final disposition are covered.

COLOR ADDITIVES IN FOOD: Senate Committee on Labor and Public Welfare August 21 ordered favorably reported with amendments S. 2197, a bill to protect the public health by amending the Federal Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerance) under which such additives may be safely used (S. Rept. No. 795).

Senate Report No. 795, Color Additive Amendments of 1959 (August 21, 1959, 86th Congress,

1st Session, Report of the Senate Committee on Labor and Public Welfare, to accompany S. 2197), 28 pp., printed. The report contains purpose and provisions of the bill, departmental comments and recommendations, present law and proposed changes, sectional analysis, and changes in existing law.

Senate August 24 passed without amendment and cleared for the House S. 2197.

COLUMBIA RIVER FISHERIES INVESTIGATION: Senate and House Conferees August 12, in executive session, filed a conference report on H. R. 7509, making appropriations for civil functions administrated by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority for fiscal year ending June 30, 1960, and for other purposes (H. Rept. 888). Included in the appropriation are funds for the Corps of Army Engineers and Bureau of Reclamation for water resources development, management, construction, and investigation programs including certain Columbia River Basin Projects.

House Report No. 888, Public Works Appropriation Bill, 1960 (August 12, 1959, 86th Congress, 1st Session, Conference Report of the Joint Senate and House Committee of Conferees to accompany H. R. 7509...), 26 pp., printed. Contains Committee on Conference recommendations on the disagreeing votes of the two Houses on the Senate amendments to H. R. 7509. Includes charts showing by States and Projects the budget estimates and Conference allowances.

House August 14 agreed to conference report (House Rept. No. 888) on H. R. 7509, voted to recede and concur in certain Senate amendments; and to recede and concur in an amendment with an amendment.

Senate August 17 adopted conference report on and cleared H. R. 7509 for the President.

The Conference-approved measure provided \$1,206,728 for water development programs of the Corps of Army Engineers, Bureau of Reclamation, the Tennessee Valley Authority, Bonneville Power Administration, and the Southeastern and Southwestern Power Administration. This figure was \$29.5 million above the House bill but \$50 million below the amount approved by the Senate.

House Conferees agreed to the Senate-approved appropriations of \$750,000 to finance River Basin Studies programs of the Bureau of Sport Fisheries and Wildlife. Earlier the Bureau of the Budget had requested that \$836,400 be provided for this purpose through direct appropriation in the Department of the Interior and related Agencies Appropriation Bill but the request was rejected. Restoration of \$750,000 in the Public Works Bill represented the recovery of a substantial part of the funds needed to determine the effects of river development programs on fish and wildlife and to compensate for losses to these resources. Language, written into the Senate bill and approved by the Conference Committee, specifically earmarks funds for these Fish and Wildlife Service investigations.

The Conferees also approved a \$280,000 Senate item for use in carrying out fish and wildlife stud-

ies in connection with the Bureau of Reclamation's Missouri Basin Project. This action restored the amount recommended by the Budget Bureau but which had been denied earlier by the House.

Funds for planning three dams within the Snake River drainage of the Columbia River Basin--Bruce's Eddy, Little Goose, and Lower Monumental--were included in the bill by action of both the House and Senate. A Senate allowance of \$200,000 for detailed planning of the lower Granite project on the Snake River was deleted by the Conference Committee.

President on August 26, 1959, vetoed H. R. 7509 (H. Doc. 222). In his veto message, the President cited that Congress had authorized and included 67 unbudgeted projects and urged Congress to enact a new bill appropriating funds only to finance projects now under construction and other going programs in the interest of an orderly development of America's water resources within the Nation's fiscal ability.

H. R. 9105 (Cannon), a bill making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, and the Tennessee Valley Authority, for the fiscal year ending June 30, 1960, and for other purposes; without amendment (Rept. No. 1152); referred to the Committee of the Whole House on the State of the Union; introduced in House September 4. Report of the House Committee on Appropriations introduced as a clean bill in lieu of H. R. 7509, Public Works Appropriation Bill, vetoed by the President August 26, 1959. The provisions of the bill are the same as H. R. 7509, as agreed to in conference by the House and Senate, with the exception that each item, project, and activity has been reduced by $2\frac{1}{2}$ percent.

House Report No. 1152, Public Works Appropriation Bill, 1960 (September 4, 1959, 86th Congress, 1st Session, Report of the House Committee on Appropriations to accompany H. R. 9105), 31 pp., printed. Report contains explanation of the bill, statement of the managers on the part of the House, and sectional analysis. Includes charts showing budget estimates and conference allowances for construction and planning by project and State.

Both Houses of Congress on September 8 passed without amendment H. R. 9105, which action cleared the bill for the President.

FEDERAL BOATING ACT OF 1958 AMEND-MENT: H. R. 8728 (Bonner), a bill to amend the Federal Boating Act of 1958 to extend for an additional year the period when certain provisions of that Act will take effect; to the Committee on Merchant Marine and Fisheries; introduced in House August 19. The Federal Boating Act of 1958 (P. L. 85-911) included the establishment of a new system of numbering small undocumented vessels propelled by machinery of 10 or more horsepower using the navigable waters of the United States. The law provides that, except to the extent that States may adopt such new numbering system in the meantime, the new system administered by the Coast Guard will go into effect April 1, 1960. The legislation is designed to provide the additional time required to put the new numbering system into effect and for Congress to authorize the necessary appropriation to carry out the provisions of the law.

Also S. 2598 (Ellender and Long), a bill to amend the Federal Boating Act of 1958 to extend until January 1, 1961, the period when certain provisions of that Act will take effect; to the Committee on Interstate and Foreign Commerce; introduced in Senate August 25. Similar to H. R. 8728 previously introduced.

House Committee on Merchant Marine and Fisheries August 27 ordered favorably reported with amendment H. R. 8728 (Rept. No. 1059).

House Report No. 1059, Amending the Federal Boating Act of 1958 to Extend Until January 1, 1961, the Period When Certain Provisions of the Act will Take Effect (August 27, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries, to accompany H. R. 8728, a bill to amend the Federal Boating Act of 1958, and for other purposes), 3 pp., printed. Contains purpose and provision of the bill, committee recommendations, and changes in existing law.

House August 31 passed H. R. 8728.

Senate Committee on Interstate and Foreign Commerce met in executive session September 1 and ordered favorably reported with amendment S. 2598 (S. Rept. 875). As amended, the bill would extend the effective date to April 1, 1961.

FISH AND WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: Subcommittee on Fisheries and Wildlife of the House Committee on Merchant Marine and Fisheries August 13 met in executive session and August 14 ordered favorably reported to the full committee H. R. 5814, a bill to provide for Fish and Wildlife cooperative research training programs between the Federal Government and the several States, colleges and universities, and private organizations.

FISH HATCHERIES: Senate Committee on Interstate and Foreign Commerce met in executive session August 12 and ordered favorably reported S. 2053, providing for the acceptance by the U.S. Government of a fish hatchery in South Carolina (S. Rept. 710). The legislation provides authority for the Secretary of the Interior to accept title to the Orangeburg County, S. C., fish hatchery, together with the right to take adequate water from the Orangeburg County Lake therefor, to acquire by purchase additional lands, and to develop, operate, and maintain the hatchery.

Senate Report No. 710, Orangeburg County, S. C., Fish Hatchery (August 13, 1959), 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce, to accompany S. 2053...), 3 pp., printed. Contains purpose and provisions of the bill, estimate of costs for construction and rehabilitation of facilities, Committee recommendations, and Departmental report.

The Senate August 19 passed S. 2053, without amendment, and cleared the bill for the House.

Senate August 19 passed without amendment and cleared for the President \underline{H} . \underline{R} . $\underline{2398}$, to provide for the establishment of a \overline{f} ish hatchery in the northwestern part of Pennsylvania.

The President August 25 signed into law H. R. 2398 (P. L. 86-206). Provides authorization to es-

tablish, construct, equip, operate, and maintain a new Federal fish hatchery in the northwestern part of Pennsylvania for the purpose of (1) stocking waters on lands owned or controlled by the Federal Government, and (2) to assist the states to fulfill fishery management obligations.

FISHERY PRODUCTS INCLUDED IN FOOD STAMP PLAN: H. R. 8595 (Hagen), a bill to direct the Secretary of Agriculture to formulate and to put into operation a food stamp program, utilizing normal channels of trade; to the Committee on Agriculture; introduced in House August 10. Provides for a food stamp program as a means of increasing food expenditures and improving dietary levels of economically needy households and of expanding domestic markets for agricultural food commodities, including agricultural, horticultural and dairy products, food products of livestock and poultry, and fishery products.

FISHING VESSEL CONSTRUCTION SUBSIDIES: Senate Committee on Interstate and Foreign Commerce August 19 ordered favorably reported S. 2578, a clean bill in lieu of S. 1374, providing for a program of assistance to correct inequities in the construction of fishing vessels.

The House August 26 passed H. R. 5421, to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the U.S. fishing industry to regain a favorable economic status. A committee substitute amendment that provided new text was adopted prior to passage of the bill. H. Res. 349, the open rule under which the legislation was considered, had been adopted earlier by a voice vote. The bill as passed by the House provides for a subsidy of not to exceed $33\frac{1}{3}$ per centum for the construction of new fishing vessels in shipyards of the United States over a 3-year period, and would authorize annual appropriations of one million dollars to carry out the provisions of the program. The subsidies would be granted only when tariff relief had been recommended by the Tariff Commission under the escape clause of the 1951 Trade Agreements Act, but denied by the President. The legislation further provides authority for the Maritime Administrator to set a subsidy based on the difference between minimum foreign and domestic shipbuilding costs, with a ceiling of $33\frac{1}{3}$ percent of the cost, and placed construction under the Administrator's supervision; stipulated that subsidy applications be made to the Secretary of the Interior and show the need to replace lost, damaged, worn out or obsolete vessels: and directed repayment of subsidies on vessels used in the commercial fisheries for which they were not designed.

S.2578 (Magnuson and 5 other Senators), a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate August 21. Introduced as a clean bill in lieu of $\underline{S}.1374$, providing for a program of assistance to correct inequities in the construction of fishing vessels.

Senate Committee on Interstate and Foreign Commerce August 24 ordered favorably reported, without amendment, S. 2578, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes

(S. Rept. 803). The legislation would provide for payment of a subsidy, not to exceed $33\frac{1}{3}$ percent, for the construction of new fishing vessels in shipyards of the United States over a 3-year period, and would authorize annual appropriations of not more than \$5 million to carry out the provisions of the program, and for other purposes.

Senate Report No. 803, Construction Differential For Fishing Vessels (August 24, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce together with individual views, to accompany S. 2578...), 15 pp., printed. Report contains purpose and provisions of the bill, background of legislation, committee and departmental comments and recommendations, and certain minority and individual views opposing the legislation.

Senate on August 25 authorized to have printed as part 2 of S. Rept. 803, certain minority views on S. 2578, providing for a program of assistance to correct inequities in the construction of fishing vessels.

Senate Report No. 803, Part 2, Construction Differential For Fishing Vessels (August 25, 1959, 86th Congress, 1st Session, Report from the Committee on Interstate and Foreign Commerce submitting Minority Views, to accompany <u>S. 2578</u>), 2 pp., printed. Report contains certain minority views opposing enactment of the legislation.

Assistance to Depressed Segments of the Fishing Industry (Hearings April 28, 29, 30, June 4, and 11, 1959, before Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries, 86th Congress, 1st Session, on H. R. 5421 and similar bills H. R. 181, H. R. 390, H. R. 3053, and H. R. 5566, to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes), 203 pp., printed including table of contents. Report contains text of bill; testimony presented by representatives of Government agencies, the Congress, and industry; additional information, letters, and telegrams submitted for the record; and various charts covering construction costs, subsidies, loans, and related subjects.

FISHING VESSEL MORTGAGE INSURANCE FUND: Senate Committee on Interstate and Foreign Commerce August 27 ordered favorably reported without amendment S. 2481, a bill to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes (S. Rept. No. 832). The legislation would create a Federal Fishing Vessel Mortgage Insurance Fund to be used by the Secretary of the Interior as a revolving fund for the purposes of carrying out the ship mortgage provisions of title XI of the Merchant Marine Act of 1936, as amended, as it applies to fishing vessels under the Fish and Wildlife Act of 1956 (70 Stat. 1122). Further provides that if at any time funds are not sufficient to pay any amount the Secretary of the Interior is required to pay on ship mortgage insurance on fishing vessels, notes or other obligations may be issued to the Secretary of the Treasury as may be necessary.

Senate Report No. 832, Relating to Vessel Mortgage Insurance Functions Transferred to Secretary of the Interior (August 27, 1959, Report of the Sen-

ate Committee on Interstate and Foreign Commerce, to accompany <u>S. 2481</u>, 6 pp., printed. Contains purpose and provisions of the legislation, Committee recommendations, and reports of interested Government departments and agencies.

GAME FISH IN DAM RESERVOIRS RESEARCH: Senate Committee on Interstate and Foreign Commerce met in executive session on August 12 and ordered favorably reported with amendment S. 1262, to establish a research program to determine means of improving the conservation of game fish in dam reservoirs (S. Rept. 707).

Senate Report No. 707, Conservation of Fish in Dam Reservoirs (August 13, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce, to accompany S. 1262), 3 pp., printed. The report contains purpose and provisions of the bill, Committee recommendations, and report of the Department of Interior. The legislation would give the Secretary of the Interior authority to conduct a nationwide study of reservoirs, Federal, State, local, or private, to determine methods for maintaining and increasing fishery assets; and would authorize the appropriations of such sums as may be necessary to carry out the provisions of the Act.

The Senate August 19 passed S. 1262, with a-mendment, and cleared the bill for the House. A-mendment provides for change to include "food" fish under the provisions of the legislation.

<u>HAWAII STATEHOOD</u>: The President August 21 signed a proclamation formally admitting Hawaii into the Union as the 50th state.

IMPORTED COMMODITY LABELING: House Committee on Ways and Means August 26 ordered favorably reported with additional amendments, H. R. 5054, a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers. Provides that imported articles removed from original container, repacked, and offered for sale, shall be marked to show to the ultimate purchaser in the United States the English name of the country of origin of such article.

House Committee on Ways and Means August 31 filed report on H. R. 5054 (H. Rept. 1078); referred to the Committee of the Whole House on the State of the Union.

House Report No. 1078, Marking of New Packages for Imported Articles (August 31, 1959, 86th Congress, 1st Session, Report of the House Committee on Ways and Means to accompany H. R. 5054...), 5 pp., printed. Report contains committee comments and recommendations, purpose and provisions of the legislation, sectional analysis, changes in existing law, and includes a copy of Section 304 of the Tariff Act of 1930, as amended.

INSECTICIDES EFFECT UPON FISH AND WILDLIFE: Subcommittee on Fisheries and Wildlife of the House Committee on Merchant Marine and Fisheries August 13 met in executive session and on August 14 ordered favorably reported to the full committee H. R. 5813, a bill providing for continuing studies of the effects of insecticides, etc., upon fish and wildlife resources.

House Committee on Merchant Marine and Fisheries met in executive session August 19 and ordered H. R. 5813 favorably reported to the House (H. Rept. 975).

House Report No. 975, Authorizing and Directing the Secretary of the Interior to Undertake Continuing Studies of the Effects of Insecticides, Herbicides, Fungicides, and Other Pesticides Upon Fish and Wildlife (August 24, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries, to accompany H. E. 5813 . . .), 6 pp., printed. Contains purpose and provisions of the bill, committee and departmental recommendations and changes in existing law. Provides amendment to Public Law 85-582 to increase from \$280,000 to \$2,565,000 the annual appropriation authorized to carry out the studies specified by that Act.

Senate Committee on Interstate and Foreign Commerce met in executive session August 12 and ordered favorably reported with amendment <u>S. 1575</u>, authorizing continued studies of the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife (S. Rept. 708).

Senate Report No. 708, Research and Studies on Insecticides (August 13, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce to accompany S. 1575...), 5 pp., printed. Contains purpose and provisions of the bill, estimate of cost, Committee recommendations, Departmental report, and changes in existing law. The legislation would amend Public Law 85-582, 85th Congress (72 Stat. 479) for the purpose of authorizing increased appropriations to carry out the studies specified by that Act.

Senate August 19 passed \underline{S} . $\underline{1575}$, with amendment, and cleared the bill for the House. Senate amendment would remove limitations on appropriations provided in the Act of August 1, 1958, and would authorize to be appropriated such sums as are necessary to carry out the purposes of the Act.

House September 2 passed with amendment H. R. 5813, authorizing continued studies on the H. R. 5813, authorizing communes supported by effects of insecticides, herbicides, fungicides, the effects of insecticides, herbicides, fungicides, the effects of insecticides, herbicides, fundicides, the effects of insecticides, herbicides, herbicides, and other pesticides upon fish and wildlife. passage was subsequently vacated and S. 1575, a similar bill, was passed by the House after being amended to contain the House-passed language and the amended bill was returned to the Senate. The House amendment to S. 1575 authorizes annual appropriations of \$2,565,000 to carry out the objectives of the Act whereas the original Senate bill before amendment provided authorization to be appropriated such sums as are necessary, thereby placing no limitation on annual appropriations to carry out the provisions of the program.

INTERSTATE TRANSPORTATION OF FISH: Senate Committee on Interstate and Foreign Commerce, in executive session August 12, ordered favorably reported to the Senate H. R. 5854, to clarify a provision in the Black Bass Act relating to the interstate transportation of fish (S. Rept. 705). The legislation would provide amendment to the Black Bass Act, as amended, to make it clear

that lawfully-taken fish or fish eggs for stocking or breeding purposes could be shipped in interstate commerce.

Senate Report No. 705, Clarifying the Black Bass Act (August 13, 1959, 86th Congress, 1st Session, Report of the Senate Committee of Interstate and Foreign Commerce, to accompany H. R. 5854), 3 pp., printed. The report contains purpose and provisions of the bill, Committee recommendations, executive communications, and changes in existing law.

The Senate August 19 passed without amendment and cleared H. R. 5854 for the President.

The President August 25 signed into law \underline{H} . \underline{R} . $\underline{5854}$, to clarify a provision in the Black Bass Act relating to the interstate transporation of fish (P. L. 86-207).

MARINE GAME FISH RESEARCH: Subcommittee on Fisheries and Wildlife of the House Committee on Merchant Marine and Fisheries met August 13 in executive session and August 14 ordered favorably reported to the full committee H. R. 5004, a bill authorizing and providing for a Marine Game Fish Research program.

House Committee on Merchant Marine and Fisheries August 19 met in executive session and ordered favorably reported to the House H. R. 5004, to undertake continuing research on the biology of migratory marine species of game fish of the U. S. and contiguous waters (H. Rept. No. 974).

House Report No. 974, Authorizing and Directing the Secretary of the Interior to Undertake Continuing Research on the Biology Fluctuations, Status, and Statistics of the Migratory Marine Species of Game Fish of the United States and Contiguous Waters (August 24, 1959, 86th Congress, 1st Session, Report of the House Committee on Merchant Marine and Fisheries, to accompany H. R. 5004 . . .), 3 pp., printed. Contains the purpose and provisions of the bill, committee recommendations, and departmental report. The legislation provides for a program of marine game fish research for the purpose of developing wise conservation policies and constructive management activities and would authorize \$2,700,000 be appropriated annually to carry out the provisions of the program.

House September 2 passed with amendment and sent to the Senate \underline{H} . \underline{R} . $\underline{5004}$, . . .

H. R. 8771 (Johnson of Maryland), a bill authorizing and directing the Secretary of the Interior to undertake continuing research on the biology, fluctuations, status, and statistics of the migratory marine species of game fish of the United States and contiguous waters; to the Committee on Merchant Marine and Fisheries: introduced in House August 24. Similar to H. R. 5004 and related bills previously introduced which would provide for a marine game fish research program.

Also <u>H. R. 8809</u> (Thompson of Texas) introduced in House August 25.

MARINE GAME FISH COOPERATIVE RE-SEARCH INVESTIGATIONS: H. R. 8968 (Saylor), a bill to authorize the Secretary of the Interior to enter into cooperative agreements with States for research and management investigations on migratory and other marine species of game fish, and for other purposes; to the Committee on Merchant Marine and Fisheries; introduced in House August 31. Would authorize and provide for a cooperative research program between the Federal Government and the several States for conservation and management of migratory marine fish, and for other purposes. Somewhat similar to H. R. 5004, and related bills previously introduced, which provide for a marine game fish research program.

OCEANOGRAPHY EDUCATIONAL ASSISTANCE: Subcommittee on Earth Science of the Senate Committee on Science and Astronautics August 25 held hearings on H. R. 6298, amending the National Science Foundation Act of 1950 to provide financial assistance to educational institutions for the development of teaching facilities in the field of oceanography and to provide fellowships for graduate study in such field. Testimony was presented by Government and public witnesses and hearings adjourned subject to call of the Chair.

Senate Committee on Interstate and Foreign Commerce August 27 held an informal executive session to meet with the Committee on Oceanography, which is made up of the leading oceanographers in the United States, and was established by the National Academy of Sciences for the purpose of studying the present and future needs for increased oceanographic research.

OYSTER INDUSTRY ASSISTANCE: S. 2632 (Williams of New Jersey and 3 other Senators), a bill to assist the States of New Jersey and Delaware in developing a strain of oysters resistant to causes which threaten the oyster industry on the east coast; to the Committee on Interstate and Foreign Commerce; introduced in Senate September 2. Would authorize the Secretary of the Interior to purchase certain oyster brood stocks and to assist the States of New Jersey and Delaware to develop and propagate a strain of oysters resistant to the excessive mortality that threatens the oyster industry of those states with extinction. Somewhat similar to certain provisions of H. R. 8060 and related bills previously introduced.

POWER PROJECTS FISHERIES RESOURCES PROTECTION: S. 2586 (Church and Neuberger). a bill to provide for the conservation of anadromous fish spawning areas in the Salmon River, Idaho; to the Committee on Interstate and Foreign Commerce; introduced in Senate August 24. The proposed legislation would prohibit authorization for dams on the Salmon River in Idaho which would exceed in height those dams presently existing on downstream sections of the Snake and Columbia Rivers. Also would prevent licensing of any project by the Federal Power Commission which would tend to have a more restrictive effect on the passage of anadromous fish than similar projects already in existence throughout the Columbia River Basin. Further, the bill would require the Secretary of the Interior to report to the Congress on any conservation developments including those relating to fish passage around dams that in his opinion would justify amending the provisions of the proposed bill. If passed, the bill would open the Salmon River to possible power projects and development. Somewhat similar to provisions of

S. Con. Res. 35 and related bills previously introduced which provide for protection of fisheries resources in connection with certain Columbia River Basin development projects.

<u>PRICE STABILITY: H. R. 8589</u> (Schwengel), a bill to amend the Employment Act of 1946 to make stability of prices an explicit part of the economic policy of the Federal Government; to the Committee on Government Operations; introduced in House August 10. Similar to \underline{H} . \underline{R} . $\underline{17}$ and related bills previously introduced.

RADIOACTIVE WASTE DISPOSAL RESTRICTIONS: Subcommittee on Radiation of the Joint Committee on Atomic Energy August 13 met in executive session to review drafts of reports on (1) Biological and Environmental Effects of Nuclear War, (2) Radioactive Fallouts from Weapons Tests, and (3) Radioactive Waste Disposal.

SALT-WATER RESEARCH LABORATORY: Senate Committee on Interstate and Foreign Commerce met in executive session August 12 and ordered favorably reported S. 1576, providing for the construction of a salt-water research laboratory at Seattle (S. Rept. 717). The legislation would provide for construction of a salt-water research laboratory in conjunction with the construction of an aquarium by the city of Seattle. The proposed laboratory would be operated jointly by the State of Washington Department of Fisheries, the University of Washington College of Fisheries and School of Oceanography, and the Fish and Wildlife Service for the purpose of conducting marine life research.

Senate Report No. 717, Construction of a Salt-Water Research Laboratory (August 13, 1959, 86th Congress, 1st session, Report of the Senate Committee on Interstate and Foreign Commerce, to accompany S. 1576...), 3 pp., printed. Contains purpose and provisions of the bill, estimated cost, committee recommendations, and Departmental report.

Senate August 19 passed S. 1576, without amendment, and cleared the bill for the House.

SEAWEEDS (GROUND, POWDERED OR GRAN-ULATED) ON FREE IMPORT LIST: House Committee on Ways and Means September 1 ordered favorably reported with amendment, H. R. 5887, to amend the Tariff Act of 1930 to place ground, powdered, or granulated seaweeds on the free list. (H. Rept. No. 1144).

House Report No. 1144, Free Importation of Ground, Powdered, or Granulated Seaweeds (September 3, 1959, 86th Congress, 1st Session, Report from the Committee on Ways and Means to accompany H. R. 5887. . .), 2 pp., printed. Report contains purpose and provisions of the bill, committee recommendations, changes in existing law, and Paragraph 1722 of the Tariff Act of 1930 as amended.

SHRIMP IMPORT DUTIES: H. R. 8769 (Herlong), a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimps and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota,

and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quotas; to the Committee on Ways and Means; introduced in House August 26. Somewhat similar to H. R. 483 and related bills previously introduced which provide for duties on shrimp importations to protect the domestic industry and for other purposes. Whereas <u>H. R. 483</u> would shift shrimp from the "free" to the "duty" list of import commodities, and provides for an ad valorem duty of 35 percent on all classifications of shrimp without exception, H. R. 8769 would provide for establishment of country-by-country import quotas and duties on both unprocessed and processed shrimp. Fresh or frozen shrimp, shell-on, veinin, and not processed in any way (except that the heads may be removed), would be free of duty if imported within the limits of the applicable quota; imports in excess of such quota would be subject to a duty of 50 percent ad valorem. All processed shrimp as defined in the bill would be subject to a duty of 25 percent ad valorem and the importation of processed shrimp in excess of the applicable quota would be prohibited.

Also identical bills H. R. 8779 (Sikes), H. R. 8789 (Fascell), H. R. 8790 (Morrison), H. R. 8791 (Rogers of Florida), H. R. 8792 (Thompson of Louisiana), and H. R. 8793 (Willis), all introduced in House August 24; H. R. 8809 (Thompson of Texas), introduced in House August 25; H. R. 8850 (Blitch), H. R. 8851 (Cramer), H. R. 8852 (Dorn of South Carolina), H. R. 8870 (Lennon), all introduced in House August 26; H. R. 8899 (Kilgore), H. R. 8900 (Preston), H. R. 8926 (Boykin), H. R. 8927 (Mathews), introduced in House August 27; H. R. 8978 (Bray), H. R. 8979 (Gross), H. R. 8980 (McMillan), H. R. 8981 (Oliver), and H. R. 8982 (Rivers of South Carolina), all introduced in House August 31; H. R. 8993 (Ashmore), H. R. 8999 (Colmer), both introduced in House September 1; H. R. 9038 (Tollefson), introduced in House September 2; H. R. 9087 (Flynt), and H. R. 9098 (Young), both introduced in House September 4; all to the Committee on Ways and Means.

SMALL BUSINESS ACT AMENDMENTS OF 1959: H. R. 8599 (Patman), a bill to amend the Small Business Act, and for other purposes; to the Committee on Banking and Currency: introduced in House August 10. The main purpose of the bill is to increase the authority of the Small Business Administration to make loans under its regular business loan program and would increase loan limitation from the present authorization of \$500 to \$700 million. In addition, H. R. 8599 would make three minor amendments to (1) authorize the Small Business Administration to make prepayments of rentals on safety deposit boxes, (2) permit Small Business Administration to file reports on its operations annually, instead of every 6 months, and (3) repeal a provision concerning surveys of Small Business Administration operations by the Attorney General.

Subcommittee No. 3 of the House Committee on Banking and Currency held and concluded hearings August 14 and ordered <u>H. R. 8599</u> favorably reported to the full committee.

House Committee on Banking and Currency August 19 ordered <u>H. R. 8599</u> favorably reported to the House (<u>H. Rept. 946</u>).

House Report No. 946, Small Business Act Amendments of 1959 (August 19, 1959, 86th Congress, 1st Session, Report of the House Committee on Banking and Currency to accompany H. R. 8599. . .), 7 pp., printed. The report contains the purpose of the bill, background of legislation, business loan authority, surveys and reports, changes in existing law, and Committee recommendations.

House August 24 passed without amendment and cleared for the Senate, <u>H. R. 8599</u>, to increase the loan authority of the Small Business Administration from \$500 million to \$700 million, and for other purposes.

Small Business Act Amendments, 1959 (Hearings August 14, 1959, before Subcommittee No. 3 of the House Committee on Banking and Currency, 86th Congress, 1st Session, on H. R. 8599. . .), 21 pp., printed. The report contains testimony presented in support of the legislation, a review of the activities of the Small Business Administration, and recommendations relating to the Small Business Act. Also contains certain charts pertaining to activities of the agency.

The Subcommittee on Small Business of the Senate Committee on Banking and Currency August 20 met in executive session on amendments to the Small Business Act and ordered draft bills favorably reported to the full committee.

S. 2612 (Proxmire), an original bill to amend the Small Business Act; reported August 27 from the Committee on Banking and Currency to the Senate and placed on the calendar (S. Rept. 834). The legislation would provide for an increase in the Small Business Administration's revolving fund for its regular business loan program; and provides authority for appropriations to continue beyond 1960, the programs of grants for studies, research, and counseling concerning the managing, financing, and operation of small-business enterprises.

Senate Report No. 834, Amending the Small Business Act (August 27, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Banking and Currency to accompany S. 2612. .), 4 pp., printed. The report contains purpose and provisions of the bill, Committee recommendations, sectional analysis, and changes in existing law.

Also H. R. 8895 (Multer), a bill to amend the Small Business Act to provide that a small business concern may not be denied assistance thereunder solely because of the type of business to which it is engaged, if such business is lawful in the community where such concern is located; also H. R. 8896 (Roosevelt); to the Committee on Banking and Currency; introduced in House August 27.

Small Business Amendments of 1959: (Hearings June 22, 29, 30, July 1, 7, 20, 21, and 22, 1959, before a Subcommittee of the Senate Committee on Banking and Currency, 86th Congress, 1st Session, on various bills to amend the Small Business Act of 1958 and the Small Business Investment Act of 1959), 699 pp., printed, including table of contents. Report contains various bills introduced, reports from agencies that were received, statements of individuals, and memorandums, statements, and letters submitted for the record.

SMALL BUSINESS AID FOR FIRMS AFFECT-ED BY FOREIGN TRADE POLICY: H. R. 9023 (Bowles), a bill to provide assistance to communities, industries, business enterprises, and individuals to facilitate adjustment made necessary by the trade policy of the United States; to the Committee on Ways and Means; introduced in House September 2. Provides governmental assistance to those communities, industries, enterprises, and individuals adversely affected by the reciprocal trade program. Would provide help from the Federal Government to retrain individuals for new jobs, to render technical and financial assistance for conversion of plants to new items of production, and to assist communities in their efforts to attract new types of industry. Somewhat similar to S. 1609 previously introduced which, among other purposes, provides for assistance to small business concerns adversely affected by the foreign trade policy.

SMALL BUSINESS INVESTMENT ACT OF 1958
AMENDMENTS: The Subcommittee on Small
Business of the Senate Committee on Banking and
Currency August 20 met in executive session on
amendments to the Small Business Investment Act
of 1958 and ordered draft bills favorably reported
to the full committee.

S. 2611 (Proxmire), an original bill to amend the Small Business Investment Act of 1958, and for other purposes; reported August 27 from the Committee on Banking and Currency to the Senate and placed on the calendar (S. Rept. 833). The legislation provides for amendments to the Small Business Investment Act of 1968 (P. L. 85-699) for the purpose of removing certain legal impediments to the formation and successful operation of small business investment companies.

Senate Report No. 833, Amendments to the Small Business Investment Act (August 27, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Banking and Currency, to accompany S. 2611...), 19 pp., printed. Contains purpose and provisions of the bill, committee recommendations, sectional analysis, and changes in existing law.

SUPPLEMENTAL APPROPRIATIONS, 1960: House Report No. 943, Supplemental Appropriations Bill, 1960 (August 18, 1959, 86th Congress, 1st Session, Report of Joint House and Senate Committee of Conference to accompany H. R. 7978, a bill making supplemental appropriations for the fiscal year ending June 30, 1960, and for other purposes), 10 pp., printed. Contains Committee recommendations on the differences between the Senate- and House-passed versions of H. R. 7978. Included are funds for transitional grants to Alaska; for the National Outdoor Recreation Resources Review Commission; and for certain River Basin Study Commissions.

House disagreed to Senate amendments to H. R. 7978, agreed to conference requested by Senate, and on August 18, appointed conferees; Joint Committee of House and Senate Conferees met in executive session and filed conference report on differences between the Senate- and House-passed versions of H. R. 7978 (H. Rept. 943). The House and Senate on August 19 adopted the conference report on H. R. 7978, which actions cleared the bill for the President.

President on September 1, 1959, signed into law H. R. 7978, supplemental appropriations for fiscal 1960 (P. L. 86-213). Included are funds for transitional grants to Alaska; for the National Out-

door Recreation Resources Review Commission (\$850,000) and for certain River Basin Study Commissions (\$1,540,000).



FOOD CONSUMPTION IN AMERICAN HOMES

At the request of certain large subscriber companies, the Market Research Corporation of America has recently concluded a National Menu Census at an estimated cost of \$750,000. The menu study is a record of food prepara-

tion and consumption in American homes based on reports by 4,000 families. Each of these families reported about menus used in the home over a two-week period, on a staggered basis.

The results of this study can be very helpful in planning business operations, developing new products, finding new users for existing products, and generally improving productivity of marketing operations.

The census tells what happens to food products brought into the home. It covers seasons, days of the week, types of families, and who in the family turns down an item when it is placed on the table.

A sampling of some of the findings of the menu study includes the following:

- 1. On a quantity basis, 4 percent of the families served more than 500 dishes in a 14-day period; 12 percent served 400-500 dishes; 33 percent served 300-400; 37 percent, 200-300; and 14 percent less than 200.
- 2. Snacks account for 8 percent of all food servings in American homes. However, one-third of all families serve three-quarters of all snack foods.
- 3. Someone in the family buys food on 45 percent of all days. Forty percent of the total family shopping trips take place on Friday and Saturday.
- 4. The morning meal is the most regular home-served meal, in that 90 percent of the families served breakfast every day in a given two-week period.

It was found that the serving frequency of fish, based on a national average of 100 percent, was a low of 70 percent in the North Central Region, and about one-fifth higher than the national average in the northeast and south. Poultry, however, was a low of 73 percent in the northeast, and approximately 50 percent higher than the national average in the south. (Excerpted from an article in Supermarket News, written in collaboration with the Market Research Corporation of America.)



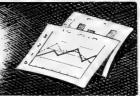
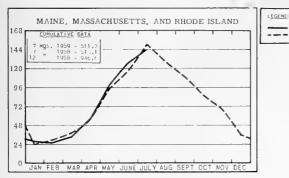
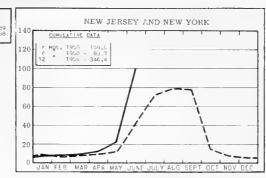
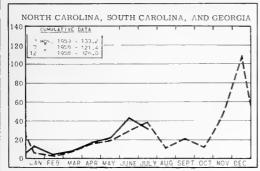


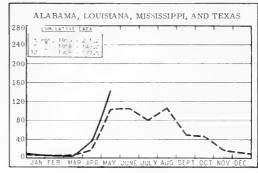
CHART I - FISHERY LANDINGS for SELECTED STATES

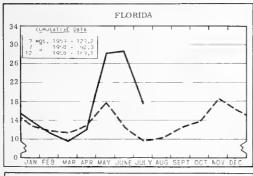
In Millions of Pounds

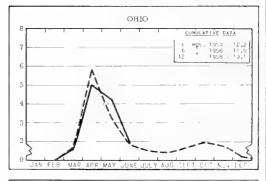


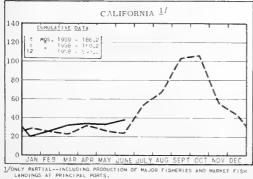












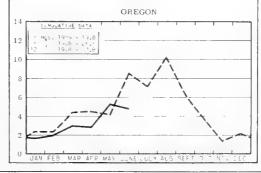
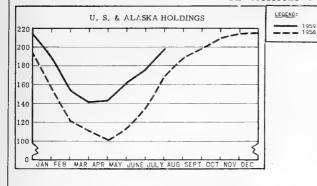
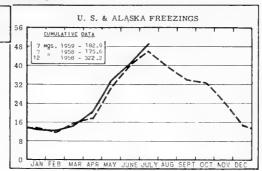


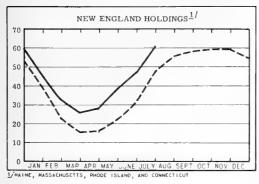
CHART 2 - LANDINGS for SELECTED FISHERIES In Millions of Pounds HADDOCK LEGEND: OCEAN PERCH (Maine and Massachusetts) (Maine and Massachusetts) 20 CUMULATIVE DATA 22 CUMULATIVE DATA 20 18 16 18 14 16 12 14 10 12 10 JAN FEB MAR APR MAY JUNE JULY AUG MAR APR MAY LUNE JULY AUG SEPT OCT NOV DE In Millions of Pounds SHRIMP WHITING (Gulf States 1/ including Florida West Coast) (Maine and Massachusetts) CUMULATIVE DATA MQS. 1959 - 54.5 1958 - 56.8 1958 - 102.0 24 20 16 12 16 MAR APR MAY JUNE JULY AUG SEPT OF 1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT PLETE. In Thousands of Tons PACIFIC AND JACK MACKEREL MENHADEN (California) (East and Gulf Coasts) CUMULATIVE DATA CUMULATIVE DATA MQS. 1959 - 10.7 , 1958 - 8.6 , 1958 - 23.2 6 5 4 3 120 2 80 40 In Thousands of Tons TUNA AND TUNALIKE FISH PILCHARD CUMULATIVE DATA CUMULATIVE DATA 1958/59 SEASON, TOTAL -1957/58 SEASON, TOTAL -24 48 - 101.6 20.5 20 40 16 32 12 24 MAR APR MAY JUNE JULY AUG SEPT OCT NOV DE

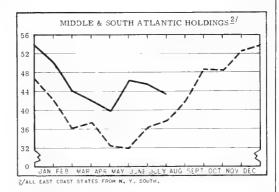
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS ★

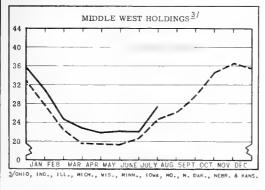
In Millions of Pounds

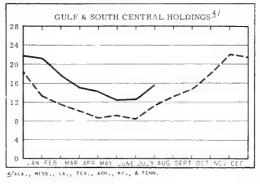


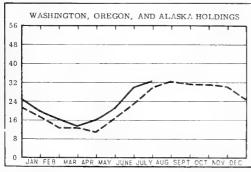


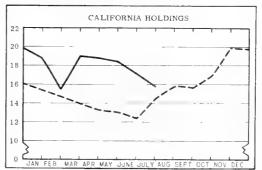






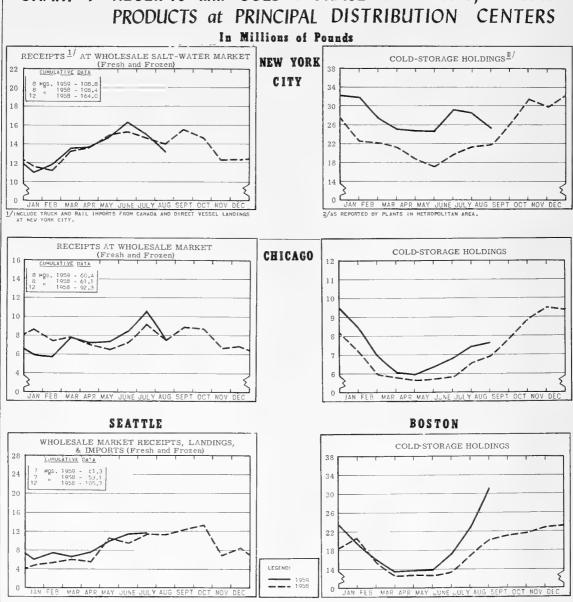






* Excludes salted, cured, and smoked products

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS



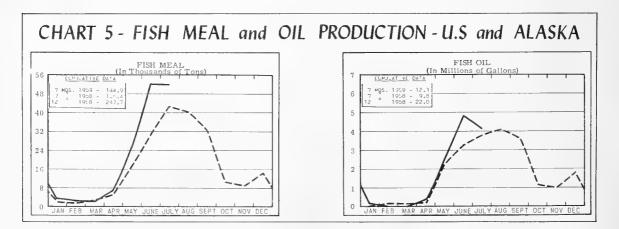
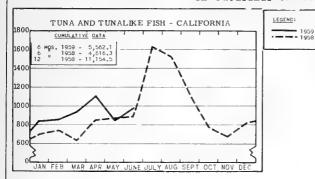
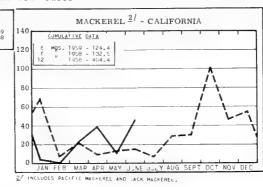
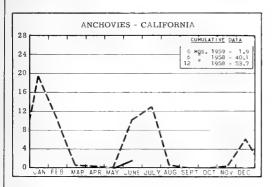


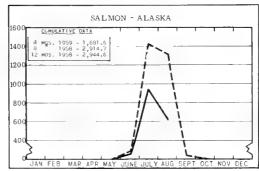
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



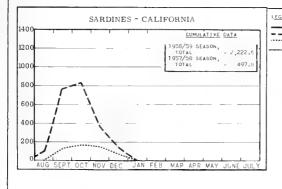






	SARDINES 1/ (Estimated) - M.	AINE
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STANDARD CASES							
Variety	No. Cans	Designation	Net Wgt.				
SARDINES	100	drawn 4	$3\frac{3}{4}$ oz.				
SHRIMP	48		5 oz.				
TUNA	48	# ½ tuna 6	&7 oz.				
PILCHARDS	48	# 1 oval	15 oz.				
SALMON	48	1-lb. tall	16 oz.				
ANCHOVIES	48	1 - lb.	8 oz.				



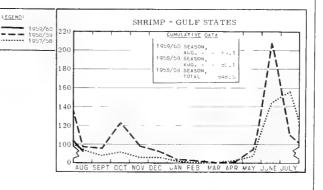
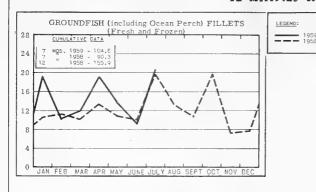
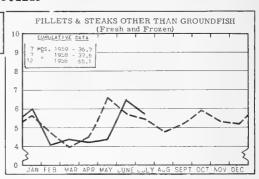
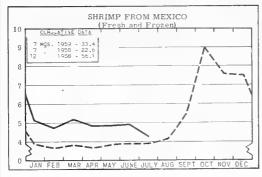


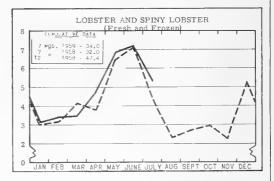
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

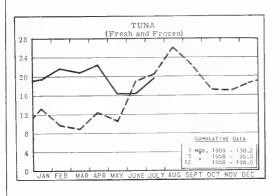
In Millions of Pounds

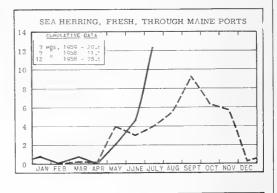


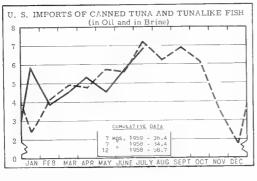


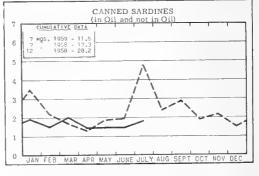














FISH AND WILDLIFE SERVICE **PUBLICATIONS**

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIG-NATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA

AND ALASKA.

FL - FISHERY LEAFLETS.

SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SSR.-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number Title

CFS-2056 - Shrimp Landings, 1958 Annual Summary, 21 pp.

CFS-2073 - Alaska Fisheries, 1958 Annual Summary, 8 pp.

CFS-2074 - Shrimp Landings, February 1959, 6 pp. CFS-2076 - Mississippi Landings, April 1959, 2 pp.

CFS-2077 - North Carolina Landings, May 1959,

3 pp. CFS-2079 - Fish Meal and Oil, May 1959, 2 pp.

CFS-2080 - Ohio Landings, May 1959, 2 pp. CFS-2081 - Rhode Island Landings, March 1959, 3 pp.

CFS-2083 - Georgia Landings, May 1959, 2 pp. CFS-2084 - Florida Landings, May 1959, 7 pp.

CFS-2085 - Massachusetts Landings, March 1959, 5 pp.

CFS-2091 - New Jersey Landings, April 1959, 3 pp. CFS-2092 - Maine Landings, May 1959, 3 pp.

CFS-2093 - California Landings, March 1959, 4 pp. CFS-2095 - New York Landings, May 1959, 4 pp.

CFS-2096 - Massachusetts Landings, April 1959, 5 pp.

CFS-2097 - South Carolina Landings, May 1959, 2 pp.

CFS-2099 - New Jersey Landings, May 1959, 3 pp. CFS-2110 - South Atlantic Fisheries, 1958 Annual Summary, 6 pp.

Canned Fish Retail Prices: FL-476i - June 1959, 27 pp.

Canned Fish Consumer Purchases: FL-478f - May 1959, 31 pp. FL-478g - June 1959, 31 pp.

Wholesale Dealers in Fishery Products (Revised): SL- 2 - New Hampshire, 1959.

SL- 5 - Connecticut, 1957. SL- 8 - Pennsylvania, 1959. SL- 10 - Maryland, 1959.

SL- 16 - Florida, 1959.

SL- 20 - Texas, 1957. SL- 26 - Illinois, 1958.

SL- 31 - New York (Lakes Area), 1958.

SL- 32 - Minnesota (Mississippi River and Tributaries), 1959.

SL- 35 - Illinois (Mississippi River and Tributaries), 1959.

SL- 37 - Kansas (Mississippi River and Tributaries), 1959.

SL-161 - Producers of Packaged Fish, 1958 (Revised).

SSR-Fish. No. 282 - Oceanographic Observations, 1959, East Coast of the United States, by C. Godfrey Day, 131 pp. illus., January 1959.

SSR-Fish, No. 291 - Stomach Contents of the Bering Sea King Crab, by Patsy A. McLaughlin and James F. Hebard, 8 pp., illus., April 1959.

SSR-Fish. No. 293 - Currents in Southeastern Bering Sea and Possible Effects Upon King Crab Larvae, by James F. Hebard, 17 pp., illus., April 1959.

SSR-Fish. No. 299 - Fishway Capacity Experiment, 1956, by Carl H. Elling and Howard L. Raymond, 31 pp., illus., May 1959.

Man, Dams, and Salmon, 6 pp., illus., processed. This folder describes the Columbia River fishery development program and its history. Describes the work carried on under the Columbia River Fishery Development Program authorized by Congress in 1946. The program was designed to conserve the fishery resources of the Columbia through artificial propagation, investigations, surveys, stocking, and stream improvement. To date, more than \$10 million has been spent on the work and it is estimated that the total cost of the program may reach \$50 million.

Summary Report, Symposium for Nutritionists, March 18, 1959, Technological Leaflet No. 20, 19 pp., illus., processed. Contains summaries of papers presented at the Symposium for Nutritionists sponsored by the Industrial Products Division, National Fisheries Institute. Issued by the U.S. Bureau of Commercial Fisheries as part of a program of nutritional advisory services in cooperation with the fishing indus-Summarizes papers on: biological value of fish meal in practical broiler rations; recent nutritional studies; fish meal as a source of unknown growth factor and of high-quality protein; feed formulation utilizing a high-speed digital computer: and practical feed formulation with fish meal and condensed fish solubles.

Sep. No. 559 - Storage Life of Pink Shrimp Held in Commercial and Jacketed Cold-Storage Rooms.

Sep. No. 560 - Surinam Fishery Explorations, May 11-July 31, 1957.

Sep. No. 561 - Fishing Vessel and Gear Developments: Equipment Note No. 1--New All-Alumium Salmon Gill-Net Boats Built for Alaska Fishery.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

(Baltimore) Monthly Summary - Fishery Products, May 1959, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Reports receipts of fresh and frozen fishery products by original receivers on the Baltimore Wholesale Fish Market. Presents receipts of species by states and Canadian provinces; and states and provinces by species; for the month indicated.

California Fisheries, 1958, by V. J. Samson, 41 pp., processed. (Market News Service, Post Office Bldg., San Pedro, Calif.) This is a review of 1958 trends and conditions in the California fisheries, including a resume of American Tuna Boat Association tuna auction sales. Among the subjects discussed are the tuna fishery (cannery receipts; total pack for 1946-58; imports of frozen tuna and canned tuna in brine; ex-vessel prices; canned tuna market conditions, prices, and standards; modernization of California purse seiners; conversion of tuna clippers to purse seiners; and changes in the tuna fleets); California sardine (pilchard) fishery (landings, ex-vessel prices, canned pack, and canned sardine prices); mackerel fishery (cannery receipts, ex-vessel prices, and canned mackerel markets and wholesale prices); anchovy fishery; canned pet-food production; whaling industry; and fishing seasons in major fisheries. Included in the statistical tables are data on tuna and tunalike fish (canners' receipts by species and by months; domestic landings; cannery receipts of frozen imported tuna; and canned pack by type of pack and by months); sardines (landings, canned pack, and meal and oil produced); mackerel and jack mackerel (canners' receipts and canned pack); canners' receipts and production of miscellaneous fishery products (receipts and canned pack of anchovies, herring, and squid; pet-food pack; and meal and oil production); California canned tuna price ranges, 1958; freezings of fish and shellfish by months; cold-storage holdings of fish and shellfish by months; landings of market fish and shellfish at Eureka, San Pedro-Santa Monica, and San Diego by species and by months; and imports of fishery products into Arizona and California Customs District, 1957-58 by commodity and country of origin.

California Fishery Products Monthly Summary,
June 1959; 13 pp. (Market News Service,
U. S. Fish and Wildlife Service, Post Office

Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, June 1959. 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1959, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries -- Monthly Summary, May 1959; June 1959; 22 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for April 1959, 18 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, June 1959, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Fluctuations in the Commercial Fisheries of Saginaw Bay, 1885-1956, by Ralph Hile and Howard J. Buettner, Research Report 51, 42 pp., illus., printed, 25 cents, 1959. This report presents, with the aid of many statistical tables and charts, the variations in abundance and in species composition of the catches during the years 1885-1956 in Saginaw Bay, Mich. Maximum and minimum catches in single years were 14.2 million pounds in 1902 and 2.8 million in 1956. Actual and percentage contributions of individual species to the total catch have varied widely, but the major change of species composition has occurred since 1943. By the early 1940's carp had taken over top position from the traditionally dominant lake herring. The interrelations of production, abundance (or availability), and fishing intensity in 1929-56 are described for the eight principal species. Of the species that command a generally good price in a strong market, only the catfish remains plentiful. Fishing pressures have been dwindling and the trend of total production has been strongly downward. The outlook for the fishery is poor. Profitable operation calls for restoration of some of the higher-priced species and this restoration in turn must await effective control of sea lampreys and a subsequent rehabilitation of fish stocks.

Fluctuation in the Population of Yellow Perch,
PERCA FLAVESCENS (Mitchill), in Saginaw
Bay Lake Huron, by Salah El-Din El-Zarka,
Fishery Bulletin 151 (From Fishery Bulletin
of the Fish and Wildlife Service, vol. 59), 55
pp., illus., printed, 40 cents, 1959.

Young Jack Crevalles (CARANX Species) Off the
Southeastern Atlantic Coast of the United States,
by Frederick H. Berry, Fishery Bulletin 152
(From Fishery Bulletin of the Fish and Wildlife Service, vol. 59), 123 pp. illus., printed,
65 cents, 1959.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE URGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ANTIBIOTICS:

Effect of Chlortetracycline (Aureomycin) on the Keeping Quality of Freshwater Fish under Tropical Conditions," by K. Visweswariah, M. N. Moorjani, D. S. Bhatia, and V. Subrahmanyan, article, Journal of the Fisheries Research Board of Canada, vol. 16, pp. 1-5, January 1959, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

AUSTRALIA:

Second Annual Report on the Operation of the Fishing Industry Act 1956 During the Year

Ended 30th June, 1958, 5pp., processed. Department of Primary Industry, Canberra, Australia. This report summarizes activities during the year ended June 30, 1958, carried out under provision of the Fishing Industry Act of 1956, which established the Fisheries Development Trust Account for the purpose of financing activities designed to foster the development of the Australian fishing industry. It presents sections on: interdepartmental advisory committee on fisheries development; operation of the trust account; survey of prawn resources; survey of pilchard resources; trawling; barracuda; tuna; participation at the International Fishing Gear Congress; and financial statement.

BIOCHEMISTRY:

Contributions to the Study of Marine Products. XLVII--22-Dehydrocholesterol," by Werner Bergmann and John P. Dusza, article, <u>The Journal of Organic Chemistry</u>, vol. 23, September 1958, pp. 1245-1247, printed. The Journal of Organic Chemistry, American Chemical Society, 1801 K St., N. W., Washington 6, D. C.

Extraction of Melanophore-Concentrating Hormone (MCH) from the Pituitary of Fishes," by Katsutoshi Imai, article, Endocrinologia Japonica, vol. 5, 1958, pp. 34-48, printed in Japanese. Endocrinological Society of Japan, Eastern Branch, Tokyo, Japan.

'On the Formation of Amine in Fish Muscle. IV-Rapid Method for the Estimation of Histamine in Fish Muscle, "by Fuyuo Ota, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, pp. 41-44, illus., printed in Japanese with English abstract and tables. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Location of Cholinesterase in Fishes," by S. J. Lundin, article, Experientia, vol. 14, 1958, pp. 131-132, printed in English. Experientia, Revue Mensuelle des Sciences Pures et Appliquees, Birkhauser, Ltd., Elizabethenstr. 15, Basel 10, Switzerland.

'Mechanism of the Antibacterial Action of Spermine," by S. Razin and R. Rozansky, article, Archives of Biochemistry and Biophysics, vol. 81, March 1959, pp. 36-54, printed. Archives of Biochemistry and Biophysics, Academic Press, Inc., 125 East 23rd St., New York 10, N. Y.

"Preliminary Study of the Distribution of Non-protein Nitrogen in Some Marine Fishes and Invertebrates," by N. L. Velankar and T. K. Govindan, article, Proceedings of the Indian Academy of Sciences, vol. 47B, 1958, pp. 202-209, printed. Indian Academy of Sciences, Bangalore, India.

'Tetrazolium Reduction Test in Relation to Species of Fish, pH of the Media, and Incubation Period," by M. N. Moorjani and J. R. Iyergar, article, Food Science, vol. 6, 1957, pp. 203-205, printed. Central Food Technological Research Institute, Mysore City, India.

BIOLOGICAL RESEARCH:

(Beaudette Foundation for Biological Research)
First Annual Progress Report June 20, 1958May 12, 1959, 13 pp. illus., printed. Beaudette
Foundation for Biological Research, Box 482,
R. F. D. 1, Solvang, Calif.

BIVALVES:

Survival of Some Juvenile Bivalves in Water of Low Salinity, by Paul E. Chanley, 14 pp., illus., printed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 48, 1958, pp. 52-65.) John B. Glude, Secretary-Treasurer, National Shellfisheries Association, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

CALIFORNIA:

Offshore Fishes of California, by John E. Fitch, 80 pp., illus., printed, 35 cents, State of California, Department of Fish and Game, Sacramento, Calif., 1958. An interestingly-written and well-illustrated booklet slanted primarily toward the sports fishermen but also of considerable interest to commercial fishermen. Presents general information on California's offshore fish and discusses habits and habitats; classification and anatomy; locomotion; food and feeding; age and growth; reproduction -sex, maturity and fecundity, spawning, eggs, and larvae; dangerous fishes; diseases and parasites; management; fishing ports; and marine aquaria. Also contains illustrations, descriptions, and fishing information for the principal species of offshore fish.

CANADA:

Fisheries Statistics of Canada, 1957 (New Brunswick), 45 pp., illus., printed in French and English, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1959. Consists of tables giving the value of the principal species of fish and shellfish in New Brunswick, 1939-1957; quantity and value of landings by species and fisheries districts, 1956-57; quantity and value of manufactured fishery products by species and fisheries districts, 1956-57; capital equipment in the primary fisheries operations, by fisheries districts, 1956-57; and the number of persons engaged in the primary fisheries operations, by fisheries districts, 1956-57.

Fisheries Statistics of Canada, 1957 (Ontario, Prairie Provinces, and Northwest Territories), 78 pp., illus., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, June 1959. This report consists of tables giving the value of the principal species of inland fish landed, 1950-57; quantity and value of landings by species and fisheries districts, 1956-57; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries. This information is presented separately for the provinces of Ontario, Manitoba, Saskatchewan, and Alberta, and for the Northwest Territories.

Summary Statistics of Canada's Fisheries, 1938-1957, 32 pp., printed. (Reprinted from Canadian Fisheries Annual, 1959, pp. 67-98.) Department of Fisheries, Ottawa, Canada. Statistics are presented in eight sections on landings and value of Canadian fisheries and related data: (1) summary statistics for 1952-1958; (2) East Coast fisheries; (3) fresh-water fisheries; (4) West Coast fisheries; (5) fillet production; and (6), (7), and (8) export and imports. Also included is a directory of fishery products by type, such as fresh and frozen fish (whole or dressed), fresh and frozen fish (filleted), smoked fish (dressed or filleted), cured fish, canned fish (not including shellfish), shellfish (in shell or meatnot canned), canned shellfish, fish oils and fish livers, fish meal, and other fishery products. Listed under each classification are the companies which process that particular product. Data are mostly for 1957, although some 1958 figures are given.

COD:

"A Comparison of Various Salt Cod Products," by F. W. Van Klaveren and R. Legendre, article, Progress Reports of the Atlantic Coast Stations, no. 71, December 1958, pp. 3-5, printed. Fisheries Research Board of Canada, Atlantic Fisheries Experimental Station, Halifax, Nova Scotia, Canada.

"Vitamins and the Reproductive Cycle of Ovaries in Cod (Gadus morrhua)," by Olaf R. Braekkan, article, Fiskeridirektoratets Skrifter Serie Teknologiske Undersokelser, vol. III, no. 7, 1958, pp. 1-19, illus., printed. Director of Fisheries, Bergen, Norway.

EAST AFRICA:

East African Fisheries Research Organization Annual Report 1958, 50 pp., printed. East African Fisheries Research Organization, P. O. Box 343, Jinja, Uganda. Describes scientific work accomplished in the fields of hydrology, plankton, invertebrates, fish, and vertebrates other than fish. Also contains appendices covering: the food of non-cichlid fishes in Lake Victoria; notes on the culture of Tilapia nigra (Gunther) in ponds; the effect of temperature on the growth rate of T. zillii; growth of T. esculenta after maturation; growth of T. esculenta from large and small eggs; a pot test study of the effect of lake mud as a fertilizer; and the growth of a lung-fish in captivity. Includes a bibliography of recent publications on East African Fisheries and related subjects.

EDUCATION:

Digest of Annual Reports of State Boards for Vocational Education to the Office of Education, Division of Vocational Education (fiscal year ended June 30, 1958), 64 pp., illus., processed. Division of Vocational Education, Office of Education, U. S. Department of Health, Education, and Welfare, Washington 25, D. C. Data in this report are taken from the annual financial and statistical reports made by the States for fiscal year ended June 30, 1958. For the first time funds were appropriated by the Congress for vocational education in the fishing industry (\$228,000). Enrollments and expenditures under this authorization are reported in 2 statistical tables. Some States have excellent pro-

grams of training for the fishing industry at the present time, and among the most popular courses are navigation, radio operation, and Diesel engine mechanics. The promotion and successful operation of several adult programs for the fishing industry indicate an acceptance of this new emphasis which was added to the vocational program by recent Congressional action. These programs consist of courses dealing with seafood merchandising and include such topics as processing, quality control, prepackaging, display, promotion, purchasing, preparation, and the serving of fishery products.

EUROPEAN COMMON MARKET:

"The United States and the European Common Market," by John A. Birch, article, The Department of State Bulletin, vol. XLI, no. 1047, Publication 6856, July 20, 1959, pp. 88-93, printed, single copy 25 cents. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) U. S. Department of State, Washington, D. C.

FATTY ACIDS:

"Analysis of Long-Chain Fatty Acids by Gas-Liquid Chromatography. Micromethod for Preparation of Methyl Esters," by Wilhelm Stoffel, Florence Chu, and Edward H. Ahrens, Jr., article, <u>Analytical Chemistry</u>, vol 31, February 1959, pp. 307-308, printed. American Chemical Society, 1801 K St., N.W., Washington 6, D. C.

"The Use of High Efficiency Capillary Columns for the Separation of Certain Cis-Trans Isomers of Long Chain Fatty Acid Esters by Gas Chromatography," by S. R. Lipsky, J. E. Lovelock, and R. A. Landowne, article, Journal of the American Chemical Society, vol. 81, February 20, 1959, p. 1010, printed. The American Chemical Society, 1801 K St., N. W., Washington 6, D. C.

FILLETS:

The Expressible Fluid of Fish Fillets. VII--Freezing Damage and Protein Denaturation under Pressure, by R. M. Love and O. Karsti, 9 pp., illus., printed. (Reprinted from the Journal of the Society of Food and Agriculture, no. 5, 1958, pp. 249-257.) Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland. Fillets of cod were frozen at different speeds under various pressure. The effects of pressure on cell damage caused during the freezing and on denaturation of the proteins during subsequent cold storage were studied, and found to vary according to the experimental conditions. They were, however, less important than the effect of the rate of freezing, and in no cases were pressed fillets after storage inferior to unpressed in 'eating" quality. It was concluded therefore that pressure during freezing was not harmful, but could be of benefit by accelerating the freezing through improved contact between the fillets and the cooling plates.

FISH FARMS:

Fish Farming, "article, Journal of Agricultre and Food Chemistry, vol. 7, February 1959,

pp. 75-76, printed. American Chemical Society, 1801 K St., N. W., Washington 6, D. C.

FISH FLOUR:

"Fish Flour. 2--Factors Influencing Rate of Extraction; 3--Hold-up Fat," by G. M. Dreosti and R. P. van der Merwe, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, pp. 34-37, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

FISH MEAL:

Experimental Shipment of Fish Meal," by A. M. Lewis, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, p. 25, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957

"Loss of 'Fat' During Storage of Fish Meal," by G. H. Stander, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, p. 23, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

FISH OILS:

'Influence of Dietary Cod-Liver Oil and Some Fractions of Cod-Liver Oil on Serum Cholester-ol-Level of Rats," article, by A. P. de Groot, Nature, vol. 183, no. 4669, April 25, 1959, p. 1191, printed. MacMillan & Co., Ltd., St. Martin's Street, London, W. C. 2, England. Describes experiments in which the cholesterol-lowering properties of cod-liver oil were compared with vegetable oils. From the results of the experiments it was concluded that cod-liver oil has a higher cholesterol-lowering activity than corn oil and hydrogenated coconut oil.

"Preparation of a Coating Material by Chlorination of Fish Oil. II--Separation of the Product from the Solution in Carbontetrachloride by Precipitation Method," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 5, 1958, pp. 381-385, illus., printed in Japanese with English abstract, tables, and figures. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

'Spectrophotometric Research on Sea-Fish Oils, by Giovanni D'Arrigo, article, Olii Minerali, Grassi e Saponi, Colori e Vernici, vol. 35, 1958, pp. 111-113, printed in Italian. Via G., Colombo 79, Milan 36, Italy.

FOOD AND AGRICULTURE ORGANIZATION:

<u>Current Bibliography for Aquatic Sciences and Fisheries</u>, vol. 2, no. 4, April 1959, 171 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Mediterranean Trawling, Second and Third Reports, General Fisheries Council for the Mediterranean, Studies and Reviews, No. 6, May 1959, 32 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of

the United Nations, Rome, Italy. Presents the text of a working paper entitled "Mediterranean Trawl Study," presented at the 5th meeting of the General Fisheries Council for the Mediterranean at Rome on October 13-18, 1958. It describes results of experiments carried out under the auspices of the Government of Israel. Details are given of recommendations concerning choice and proper adjustment of otter boards; simplification of net design; increased opening height of the net; and use of strong, non-rotting synthetic fibers.

FOREIGN'TRADE:

Sources of Information on Foreign Trade Practice, 51 pp., printed, 25 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., January 1959. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This pamphlet is a revision of the bibliography, Foreign Trade Practice, issued by the U. S. Department of Commerce in June 1954. It presents sections on governmental sources, Department of Commerce publications, general sources, market analysis, statistics, regulations, preparing shipments, transportation, finance, standards, trade terms, arbitration, bibliographies and checklists, directories, and private trade journals.

FRANCE:

France Pêche, No. 30, June 1959, 68 pp. illus., printed in French. France Pêche, Tour Sud-Est, Rue de Guemene, Lorient, France. Contains, among others, the following articles: "Apres le 2º Congres Mondial des Bateaux de Pêche" (After the Second World Fishing Boat Congress), by Robert Lenier; "Les Langoustiers Bretons en Mauritanie" (Breton Crayfish Fishermen in Mauretania); "Les Oiseaux et la Peche" (Birds and Fishing), by Edouard Priol; and "Les Peches Marocaines et la France" (Morocco's Fishing and France).

La Pêche Maritime (The Marine Fishery), vol. 38, no. 975, June 1959, 67 pp., illus., printed in French. Les Editions Maritimes, 190 Boulevard Haussmann, Paris, France. Contains among others, the following articles: "Le Marche de la Sardine dans le Monde" (The Sardine Market in the World), by Geep; "L'Evolution du Marche de la Sardine" (The Evolution of the Sardine Market), by L. Plouas; "Donnees Economiques du Marche Sardinier" (Economic Data on the Sardine Market), by Andre-Marie d'Avigneau; "L'avenie de la Peche a la Sardine aux Sables-d'Olonne" (The Future of the Sardine Fishery at Sables-d'Olonne), by E. Anger; "L'aide Technique de l'Institut des Peches aux Marins-Pecheurs Sardiniers" (Technical Aid from the Fish Institute to Sardine Fishermen), by M. Letoux; "Le 'Ring Net,' Facteur d'Equilibre sur le Marche Algerien de la Sardine" (The 'Ring Net," the Balancing Factor in the Algerian Sardine Market), by R. Simonnet; "L'organisation de la Peche a la Sardine au Portugal" (The Organization of the Sardine Fishery in Portugal).

FREEZING:

Bibliography of Literature of Freezing Technology--January, 1958, to Date, "article, Frosted Food Field, vol. 29, no. 6, July 1959, pp. 26-27, printed. Frosted Food Field, 111 No. Wabash, Chicago, Ill. This bibliography covers production and plant practice, product information, and research development and quality control.

"Fish Freezing Problems and Techniques," by M. B. F. Ranken, article, <u>World Fishing</u>, vol. 7, November 1958, pp. 63, 64, 69, and 70, printed. World Fishing, John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London, N. W. 1, England.

'Studies on the Organic Phosphates in Muscle of Aquatic Animals. V--Changes in Muscular Nucleotides of Carp During Freezing and Storage," by Tsuneyuki Saito and Ken-ichi Arai, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 5, 1957, pp. 265-268, illus., printed in Japanese with English abstract, figure, and tables. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

FROZEN FISH:

'Fat Hydrolysis in Frozen Fish. 1--Free Fatty Acid Formation," by W. J. Dyer, Doris I. Fraser, and E. G. Bligh, article, <u>Progress Reports of the Atlantic Coast Stations</u>, no. 71, December 1958, pp. 17-19, printed. Fisheries Research Board of Canada, Atlantic Fisheries Experimental Station, Halifax, Nova Scotia, Canada.

GERMANY:

Allgemeine Grundlagen der Fischereipolitik (Basic Policies for Fisheries), by Dr. Wilhelm Blanke, 110 pp., illu., processed, in German. Forschungsstelle fur Fischereiwirtschaft, Parkstrasse 50, Bremen, Germany, 1959.

HADDOCK:

Rapid Determination of the Quality of Whole Evis-cerated Haddock, by B. E. Proctor, J. T. R. Nickerson, T. L. Fazzina, L. Ronsivalli, R. K. Smith, and J. Stern, 5 pp., illus., printed. (Reprinted from Food Technology, vol. 13, no. 4, April 1959, pp. 224-228.) Department of Food Technology, Massachusetts Institute of Technology, Cambridge 39, Mass. A test based on the refractive index of the eye fluids of haddock has been developed as a criterion of quality. The refractive index of haddock eye fluids was shown to be correlated with organoleptic scores made on cooked meat from the same fish and with the time of storage at refrigerator temperatures above freezing. Changes in the physical properties of haddock eye fluids during storage at refrigerator temperatures above freezing are, according to this report, probably due to enzyme action, since there was no evidence that bacterial composition is involved in such changes.

INDUSTRIAL FOOD SERVICES:

Buying Practices and Food Use of Employee Food
Services in Manufacturing Plants, by Rosalind C.
Lifquist, Marketing Research Report No. 326,

139 pp., illus., processed, 75 cents. Marketing Research Division, Agricultural Marketing Service, United States Department of Agriculture, Washington 25, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.). This report presents data collected during a nationwide survey of inplant facilities conducted in January-February 1956. Nearly 6,000 manufacturing plants with 250 or more employees -- about onehalf the plants of this size in the United States -provided some type of regular on-premise, food-serving facility for use of plant personnel. The report discusses, among others, these aspects of the survey: collection of data, characteristics of plants with food services; characteristics of food services; purchasing practices; stocks of food on hand; and expenditures for and use of various types of food. A large section of the report contains statistical tables showing results of the survey. The section on fish and shellfish mentions that proportionally over 8 out of 10 inplant food services used some kind of fishery product during the survey period with about three-fourths of the facilities making purchases at least once a week.

Employee Food Services in Manufacturing Plants, Marketing Research Report No. 325, 102 pp., illus., processed, 50 cents. Marketing Research Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., June 1959. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) Expenditures for food represent a large part, in some cases the single most important part, of the purchases of American families. Recent years have witnessed marked changes in consumption patterns, one of these being the greatly increased practice of eating away from home. This report presents the results of a study of one segment of the "away from home" food market: the food facilities which manufacturing plants provide for their employees. Data on the utilization of fish and shellfish products are included.

INSTITUTIONAL FOOD SERVICES:

Policies and Practices of Some Leading Institutional Wholesale Grocers, Marketing Research Report No. 335, 43 pp., illus., processed, 25 cents. Marketing Research Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., June 1959. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) An increasing share of the Nation's food is being marketed by food service establishments such as restaurants, cafeterias, hotels, schools, and other away-from-home eating places, according to this report. One fourth of consumer's food dollar on average is spent for food served away from home. In this survey, case studies were made of nine selected wholesaling firms whose annual sales to food service operators ranged from slightly less than \$1 million to almost \$5 million.

IRRADIATION PRESERVATION:

'Storage Characteristics of Some Irradiated Foods Held at Various Temperatures Above Freezing. I--Studies with Chicken Meat and Sweet Potatoes," by J. L. Licciardello, J. T. R. Nickerson, B. E. Proctor, and C. L. Campbell, article, Food Technology, vol. 13, no. 7, July 1959, pp. 398-404, illus., printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

'Storage Characteristics of Some Irradiated Foods Held at Various Temperatures Above Freezing. II--Studies with Pork Sausage and Scallops, by J. J. Licciardello, J. T. R. Nikererson, B. E. Proctor, and C. L. Campbell, article, Food Technology, vol. 13, no. 7, July 1959, pp. 405-409, illus., printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill. Storage studies were carried out with irradiated pork sausage and scallops held for 8 to 10 months at temperatures ranging from 50° F. to 125° F. Even after 8 months! storage at 50° F., irradiated pork sausage was considered acceptable in flavor. At storage temperatures of 68° F. or above, irradiated samples became unacceptable within 2 months. Irradiated scallops were considered to be acceptable after 10 months' storage at 500 F. or 680 F.; however, a marked deterioration in quality occurred within one month in samples held at 125° F. Non-enzymatic browning, which caused off-flavor and color degradation, played the principal role in deterioration of irradiated scallops during storage, but texture losses also occurred. In regard to irradiated pork sausage. texture change and associated off-flavors due to proteolytic enzyme action chiefly contributed to loss of quality. Color changes and fat oxidation also occurred.

JAPAN:

Export Inspection System of Japan, World Trade Information Service, Part 2, No. 59-45, 8 pp., printed, 10 cents. U.S. Department of Commerce, Bureau of Foreign Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., and by U. S. Department of Commerce Field Offices.) Describes the structure of Japan's export inspection system as established on February 1, 1958. by a new Export Inspection Law which makes export inspection mandatory for 145 major categories of goods including frozen marine products, dried aquatic products, salted aquatic products, fish-liver oil, agar-agar, fish meal and fish scrap, seed oyster, and canned foods. Published as an aid to the United States importer, this report covers: the role of inspection, improvement in inspection, inspection organizations, designated commodities, inspection procedures, using the system, trade disputes arising over quality, and protecting the buyer. An appendix lists designated export inspection commodities.

LIGHT FISHING:

"La Pêche a la Lumiere--Les Essais de l'Institut Scientifique des Peches" (Light Fishing--Experiments of the Scientific Fisheries Institute), by G. Kurc and A. Percier, article, France Peche, no. 31, July-August 1959, pp. 34-42, illus., printed in French. France Peche, B. P. 179, Lorient, France.

MARINE ALGAE:

Paper Chromatographic Study on Sugar Component of Red Algae, by Takehiko Nakamura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, nos. 7 and 8, 1957, illus., printed in Japanese with English abstract, table, and figure. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

'Some Algae from Clipperton Island and the Danger Islands," by E. Yale Dawson, article, Pacific Naturalist, vol. 1, no. 7, June 30, 1959, 7 pp., illus., printed, Beaudette Foundation for Biological Research, Box 482, R. F. D. 1, Solvang, Calif.

"William H. Harvey's Report on the Marine Algae of the United States North Pacific Expedition of 1853-1856," by E. Yale Dawson, article Pacific Naturalist, vol. 1, no. 5, March 19, 1959, 39 pp., illus., printed. Beaudette Foundation for Biological Research, Box 227, R. F. D. 1, Solvang, Calif.

NEW ENGLAND:

The New England Fisheries Industry, by Harvey R. Sherman, 56 pp., processed, very limited distribution. Legislative Reference Service, U. S. Library of Congress, Washington 25, D. C. A brief survey of its economic state, its problems, and some possible measures for its improvement.

NORWAY:

Arsmelding 1957 fra Fiskeridirektoratets Kjemisk-Tekniske Forskningsinstitutt (1957 Annual Report from the Fisheries Directorate of the Chemi-Technological Research Institute), no. 3, 54 pp., illus., printed in Norwegian with English summary. Kjemisk-Tekniske Forskningsinstitutt, Bergen, Norway, 1958.

'Lofotfiskets Ionnsomhet 1958" (Value of Lofoten Fisheries, 1958), by Georg Oppendal, article, Fiskets Gang, vol. 45, no. 21, May 21, 1959, pp. 302-312, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

Naeringsverdi og Vitaminer i Norsk Fisk og Fiskevarer (Nutritional Values and Vitamins of Norwegian Fish and Fish Products), by Torleiv Taarland, Erling Mathiesen, Øydis Øvsthus, and Olaf R. Broekkan, 8 pp., illus., printed. (Reprinted from Tidsskrift for Hermetikkindustri, no. 11, 1958, pp. 405-412.) Trykt I, Aktietrykkeriet I, Stavanger, Norway.

"Vitaminer i Norsk Fisk III--Vitaminer i Forskjellige Organer fra de Viktigste Torskefisker
(Gadidae) Fanget Langs Norskekysten" (Vitamins in Norwegian Fishes. III--Vitamins in
Different Organs from the Most important Gadus-Fishes (Gadidae) Caught off the Coast of
Norway), by Olaf R. Braekkan, article, Fiskeridirektoratetes Skrifter, Serie Teknologiske Undersokelser, vol. III, no. 6, pp. 1-32, illus.,
printed in Norwegian with English summary.
The Director of Fisheries, Bergen, Norway,
1958.

OYSTER DRILL:

Burial as a Method for Control of the Common Oyster Drill, UROSALPINX CINEREA, of Long Island Sound, by V. L. Loosanoff and C. A. Nomejko, 7 pp., illus., printed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 48, 1958, pp. 83-89.)

John B. Glude, Secretary-Treasurer, National Shellfisheries Association, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

PARASITES:

Studies on Helminth Parasites from the Coast of Florida. IV. Digenetic Trematodes of Marine Fisheries of Tampa, Boca Ciega Bays, and the Gulf of Mexico, by Franklin Sogandares-Bernal and Robert F. Hutton, Contribution Number 16, 15 pp., illus., printed. The Florida State Board of Conservation Marine Laboratory Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

POLLOCK:

'Nitrite Preservation of Pollock," by G. A. Dolbish and M. G. Syromyatnikova, article, <u>Rybnoe Khoziaistvo</u>, vol. 34, no. 6, 1958, pp. 55-58, printed in Russian. Kotel 'nicheskaia Naberezhiaia D 1/15, Souizpechati Otdelu 'Zhurnal-Pochtoi," Moscow, Zh-240, U. S. S. R.

PROTEINS:

'Protein in Fish Muscle. 12--Ultracentrifuge Studies on Post-Rigor Extracts of Structural Protein," by D. G. Ellis and P. M. Winchester, article, Journal of the Fisheries Research Board of Canada, vol. 16, January 1959, pp. 33-41, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

'Proteins in Fish Muscle. 13--Lipid Hydrolysis,' by W. J. Dyer, and Doris I. Fraser, article, Journal of the Fisheries Research Board of Canada, vol. 16, January 1959, pp. 43-52, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

PURSE SEINES:

'Model Experiments on the Sardine Purse Seine Operating in Hyuganada, V.," by Yunosuke Itaka, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 9, 1958, pp. 511-513, illus., printed in Japanese with English abstract, figures, and table. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

QUALITY:

'Chromatic Reaction for Deciding Fish Freshness II," by Elvira Cavallone, article, Atti Societa Italiana delle Scienze Veterinarie, vol. 11, 1957, pp. 635-638, printed in Italian. Societa Italiana delle Scienze Veterinarie, Stabilimento Grafico, F. LLi. Lega, Faenza, Italy.

"The Determination of Volatile, Permanganate-Reducing Substances in Sea Fish, a Useful Method for the Objective Estimation of Quality,

by H. Wittfogel, article, Fishchwaren und Feinkost-Industrie, vol. 30, 1958, pp. 4-8, printed in German. Fachblatt fur Alle Betriebszweige der Fischverwertungstechnik, Verlag Elbe-Weser, Dr. Seyfarth & Co., Fernsprecher 4101, Bremerhaven F., Germany.

'Improvement in Quality of Iced White Fish Presservative Ices," article, <u>Food Investigation 1957</u>, Report of the Food Investigation Board (Great Britain), 1958, pp. 4-5, printed. Her Majesty's Stationery Office, York House, Kingsway, London E. C. 2, England.

SALMON:

The Acid-Soluble Nucleotides of Salmon Liver, by H. Tsuyuki, Violet M. Chang, and D. R. Idler, Studies 1957 from the Stations of the Fisheries Research Board of Canada, FRB No. 522, 9 pp., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

SALT FISH:

'Mold Contamination in Salt Fish and Method of Control," by H. P. Dussault, article, Progress Reports of the Atlantic Coast Stations, No. 71, December 1958, pp. 13-15, printed. Fisheries Research Board of Canada, Atlantic Fisheries Experimental Station, Halifax, Nova Scotia, Canada.

SANITATION:

Chlorinated Sea Water Cleans and Sanitizes Fish Holds," by Joseph W. Slavin, article, Fishing Gazette, vol. 76, January 1959, pp. 21-26, printed. Fishing Gazette Publishing Corp., 461 Eighth Ave., New York 1, N. Y.

SARDINES

Integration of Organized Food Technology into a System for Maine Sardine Production Control, by Berton S. Clark, article, Food Technology, vol. 13, no. 6, June 1959, pp. 289-293, illus., printed, single copy--domestic \$1.50, foreign \$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 510 North Hickory, Champaign, Ill. The relatively new research and quality control program of the Maine sardine industry is presented. The author describes the research phase of the program which was inaugurated early in 1954. Immediate action was taken to develop basic information concerning the technology of production operations and to devise a grading procedure to measure the quality of the product. The quality grading phase of the program was maintained on a voluntary basis throughout the 1955, 1956, and 1957 seasons and numerous quality improvements were made by commercial application of the technological principles disclosed by the investigations, coupled with analysis of a mounting volume of quality grade data. The author states that, 'The State of Maine and all associated with this enterprise can take pride in having upgraded not only a product but also an industry.

SEA NETTLES:

'Nettles of the Sea," by Romeo Mansueti, article, Nature Magazine, vol. 52, no. 6, June-July 1959, pp. 293-295, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St., NW., Washington 6, D. C. Discusses the life history, which is still much of a mystery, and habits of two varieties of the sea nettle, Dactylometra quinquicirrha. Throughout its range from southern New England to Brazil, the sea nettle prefers the quiet brackish waters of shallow bays, estuaries, and other inland Atlantic waterways; rarely is it encountered in large numbers in the open ocean.

SEAWEED:

(Institute of Seaweed Research) Annual Report for 1958, 23 pp., printed. Institute of Seaweed Research, Inveresk, Midlothian, Scotland. This report covers the activities of the Institute during 1958, its information and technical assistance services, and ecological research studies. It also gives a summary of the work carried out under extramural contract and on a collaborative basis during 1958 covering algal chemistry, plant physiology, microbiology, and other applications of seaweed and algal chemicals.

"A New Gigartinoid Grateloupia (Red Algal) from Hawaii," by E. Yale Dawson, article, Pacific Naturalist, vol. 1, no. 1, December 17, 1958, 4 pp., illus., printed. Beaudette Foundation for Biological Research, Box 227, R. F. D. 1, Solvang, Calif.

SHARKS:

The Florida Shark Story, by Robert F. Hutton, Educational Series No. 13, 35 pp., illus., printed. Florida State Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla., March 30, 1959. Presents the results of a survey to determine as many facts as possible about sharks in Florida waters, their danger to swimmers, and precautionary measures against the sharks. Records of shark attacks, kept since about 1919, indicate an average of less than one unprovoked shark attack per year. The attacks are most likely to occur during the months of June and July. Hungry, vicious, injured or trapped sharks are most likely to attack man. According to current information, only 11 species of sharks in Florida waters are considered to be dangerous or potentially dangerous. Swimmers are advised to avoid areas where fish have recently been cleaned and to swim in groups rather than alone.

SHRIMP:

Investigations on the Parasites and Diseases of Saltwater Shrimps (Penaeidae) of Sports and Commercial Importance to Florida (Preliminary Report), by Robert F. Hutton, Franklin Sogandares-Bernal, Bonnie Eldred, Robert M. Ingle, and Kenneth D. Woodburn, Technical Series No. 26, May 5, 1959, 36 pp., illus., printed. Director, State Board of Conservation, Tallahassee, Fla. This investigation was supported in part by a U. S. Public Health Service grant. A historical review of published works dealing with the parasites and diseases of penaeid shrimps from the Gulf of Mexico is presented. A brief description of several parasites is given. Geographical localities of the hosts, as well as

locations of the parasites in the hosts, are included. Evidence indicating incidence of infection by the various parasites and the possible use of certain shrimp-parasites as migratory "tags" are discussed.

A Report on the Shrimps (Penaeidae) Collected from the Tortugas Controlled Area, by Bonnie Eldred, Special Scientific Report No. 2, 8 pp., processed. Florida State Board of Conservation Marine Laboratory Maritime Base, Bayboro Harbor, St. Petersburg, Fla., May 1959. Concern that the taking of small shrimp from the Tortugas shrimping grounds might possibly jeopardize the production from this area prompted the Florida legislature in 1957 to enact a law which designated a portion of the grounds which was associated with small shrimp and possibly a nursery area, to be controlled and investigated. In accordance with this law, the State Board of Conservation was directed to carry out periodic shrimp sampling in this Tortugas controlled area to obtain information on the frequency and abundance of undersized shrimp. The investigation was started during November 1957. This report presents details of findings on the pink shrimp and seven additional species of this family in the Tortugas controlled area, in the subsequent 12 months period.

The Shrimp Fishery of the Gulf of Mexico (Rio Grande River to St. Marks, Florida), Informational Series No. 2, 5 pp., printed. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La., March 1959. Presents biological notes on the brown shrimp and the white shrimp; recommendations on closed seasons--nursery areas, offshore waters, and size limit; and recommendations on night fishing, gear, and bait shrimp.

SMOKED FISH:

'Technology of Smoked Foods," by W. W. Foster, article, Food Manufacture, vol. 34, February 1, 1959, pp. 56-61, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden Street, London N. W. 1, England.

SPERM OIL:

'Sperm Oil, Some Possible Uses," by Enrico Wahnon, article, Ingegneria Chimica, vol. 38, 1956, pp. 107-118, printed in Italian. Ingegneria Chimica, Negroli 51, Milan, Italy.

SQUID:

Preservation of the Squid (Loligo vulgaris) Topographical Distribution of its Enzymes," by Enrique Castella Bertran, T. Perez Garcia, A. Alvaro Pascual, and R. Ballesteros, Anales del Instituto de Investigaciones Veterinarias, vol. 7, 1955-56, pp. 83-91, printed in Spanish with English and German summaries. Instituto de Investigaciones Veterinarias, Universidad de Madrid, Madrid, Spain.

TARIFFS AND TRADE:

Operation of the Trade Agreements Program, 11th Report, July 1957-June 1958, 361 pp., processed. Secretary, U. S. Tariff Commission, Washington 25, D. C., 1959. During the period covered by the report, the Contracting Parties to the General Agreement on Tariffs and Trade did not sponsor any multilateral tariff negotiations of the Geneva-Annecy-Torquay type. Shortly before the close of the period, however, they commenced negotiations with Switzerland looking toward its provisional accession to the General Agreement. The United States engaged in limited trade-agreement negotiations with Brazil, Austria, Canada, Ceylon, Greece, and the Union of South Africa. Other developments include the new legislation relating to the extension of the President's authority to conclude trade agreements; the proposed legislation concerning United States participation in the Organization for Trade Cooperation; the establishment by Executive Order of the Cabinet-level Trade Policy Committee; the major developments relating to the general provisions and administration of the General Agreement: the actions of the United States relating to its trade agreements program; and the changes made in tariffs, exchange controls, and quantitative trade restrictions by countries with which the United States has trade agreements.

United States Import Duties, 1958, Miscellaneous Series, TC 1.10:Im7/4/958, 364 pp., processed, \$3. United States Tariff Commission, Washington 25, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents schedules of articles subject to duty and of articles free of duty as of July 1, 1958. Contains a section on fish and shellfish products under Schedule 7--Agricultural Products and Provisions.

TERRITORIAL SEA:

Measurement of the U.S. Territorial Sea,"by G. Etzel Pearcy, article, The Department of State Bulletin, vol. 40, no. 1044, June 29, 1959, pp. 963-971, illus., printed. Public Services Division, Bureau of Public Affairs, U.S. Department of State, Washington 25, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.). Discusses the methods for and significance of careful delineation of the United States territorial seas. The United States traditionally recognizes a zone of 3 nautical miles in breadth, giving it a territorial sea slightly larger than the combined areas of Massachusetts, Connecticut, Rhode Island, and New Jersey. Definite knowledge as to whether any given offshore point lies in or beyond the territorial sea may be of the utmost consequence. In order to have the territorial sea charted as exactly 3 miles in breadth at any point along the coast, the following rule must be observed: every point on the outer limit of the territorial sea must be plotted precisely 3 nautical miles from the nearest point on the coast along which it is measured. Fishing rights within the territorial sea are restricted to the coastal state, but beyond it the general principle of freedom of fishing pertains. There is much discussion throughout the world relative to a territorial sea with a breadth greater than 3 miles. In March or April 1960 a United Nations conference is sched-

uled to convene at Geneva in an effort to settle, among other issues, a territorial sea with a breadth acceptable to all states.

TRADE AGREEMENTS:

Third Annual Report of the President of the United
States on the Trade Agreements Program, 77
pp., printed. The White House, Washington, D. C., June 1959. The third annual report on the operation of the Trade Agreements Program. The following subjects are discussed: (1) 1958 trade developments; (2) the tradeagreements program and the GATT; (3) regional integration; (4) U. S. tariff negotiations; (5) the safeguarding procedures of the trade agreements program; (6) restrictions against U. S. exports; and (7) the 1958 extension of U.S. trade agreements legislation. Also includes a report to the Secretary of State by the Chairman of the United States Delegation to the Thirteenth Session of the Contracting Parties to the General Agreement on Tariffs and Trade held at Geneva, Switzerland, October 16-November 22, 1958; and a report on relaxation of quantitative restrictions against United States ex-

TRADE LISTS:

The Office of Economic Affairs, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 each.

- Oils (Animal, Fish, and Vegetable) -- Importers,
 Dealers, Producers, Refiners, and Exporters,
 Costa Rica, 6 pp. (June 1959). Lists the names
 and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish oils.
- Oils (Animal, Fish, and Vegetable) -- Importers,
 Dealers, Producers, Refiners, and Exporters -Mexico, 26 pp. (July 1959). Lists the names and
 addresses, size of firms, and types of products
 handled by each firm. Includes firms dealing in
 fish oils.
- Oils (Animal, Fish, and Vegetable) -- Importers,
 Dealers, Producers, Refiners, and Exporters -United Kingdom, 17 pp. (June 1959). Lists the
 names and addresses, size of firms, and types
 of products handled by each firm. Includes firms
 dealing in fish oils.

TUNA:

'La Campagne 1959 de l'Albacore en Afrique Occidentale' (The 1959 West African Campaign for Tuna), by Alain de Torquat, article, La Pêche Maritime, vol. 38, no. 974, May 1959, pp. 261-262, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

'Canned Tuna, I--Determination of Various Components in Canned Tuna; II--pH Determination of Canned Tuna Liquids," by Masayuki Kochi and Shitoku Era, article, Norinsho Suisan Koshusho Kenkyu-Hokuku (Journal of the Shimonoseki College of Fisheries), vol. 7, 1957, pp. 33-43, printed in Japanese with English titles and abstracts. Ministry of Agriculture and Forestry, Marine Products Training Center, Shimonoseki, Japan.

'Quatrieme Port Thonier de France, les Sables d'Olonne Preparent la Prochaine Campagne Avec Optimisme" (Sables-d'Olonne, the Fourth Tuna Port of France, Makes Optimistic Preparations for the Next Season), article, La Peche Maritime, vol. 38, no. 974, May 1959, pp. 263-264, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

'Que nous Reserve l'Avenir de Notre Peche Thoniere?'' (What does the Future Hold for Our Tuna Fishery?), by Andre Dhellemmes, article, <u>La Peche Maritime</u>, vol. 38, no. 974, May 1959, pp. 257-260, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

'Regards sur la Campagne Thoniere en Cote Basque' (A Look at the Tuna Campaign along the Basque Coast), by G. Pommereau, article, <u>La Peche Maritime</u>, vol. 38, no. 974, May 1959, p. 265, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

VITAMINS:

"A Comparative Study of Vitamins in the Trunk Muscles of Fishes," by Olaf R. Braekkan, article, Fiskeridirektoratets Skrifter, Serie Teknologiske Undersøkelser, vol. III, no. 8, 1959, pp. 1-42 and 4 plates, illus., printed. The Director of Fisheries, Bergen, Norway.

WAGE LAWS:

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International Acts Series 4193, 4 pp., printed, 5 1959. (For sale by the Superintendent of Docu-

ington on December 2, 1946, Treaties and Other | ments, U. S. Government Printing Office, Washington 25, D. C.). Presents the amendments adopted cents. Department of State, Washington 25, D. C., at the Tenth Meeting of the International Whaling Commission, London, June 23-27, 1958.



HELICOPTER USED TO TAKE SEAL CENSUS

The census of 14,000 seals and sealions was taken by two scientists of the University of California, Los Angeles, in the spring of 1959. The U. S. Air Force and Navy cooperated in the project.

A majority of the census population was made up of California sea lions, which numbered 13,000, a 13-fold increase since the '30's.

The elephant seal which was once brought to the brink of extinction by commercial hunters is making a strong comeback and now numbers in excess of 400, possibly as high as 683. Steller sea lions which numbered 2,000 in 1938 are now down to about 50. The population of harbor seals appears to be about 100.

Two other seals, the Guadalupe fur seal and the Alaska fur seal are known to occur in southern California waters, but none were seen during the census.

It is thought that the rapid increase of the California sea lion and decrease of the Steller sea lion may be due to a warming of the water, resulting in distribution changes of critical food species of fish and invertebrates which are relatively sensitive to such temperature changes. The two varieties of seals are known to have somewhat different food preferences.

The census was taken using aerial photographs in the channel islands of San Nicolas, Anacapa, Santa Barbara, Santa Cruz, Santa Rosa, and San Miguel.

The largest single population observed was on San Miguel, where 8,009 California sea lions, 34 Steller sea lions, 15 harbor seals, and 320 elephant seals were photographed during one observation. (Science News Letter, June 13, 1959.)

Editorial Assistant -- Ruth V. Keefe

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Compositors--Jean Zalevsky, Alma Greene, Helen Joswick, and Vera Eggleston

* * * * *

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Cover page and pp. 50, 51, 54, 69, 73, and 77-FAO.

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BETTER MEALS BUILD BETTER FAMILIES

'Better Meals Build Better Families' was the theme of a vigorous nation-wide Food-Industry Promotion which climaxed during the period September 14-16, 1959. This promotion, reported to be one of the most powerful single merchandising opportunities made available to food advertisers, was conceived by the Bu-



reau of Advertising of the American Newspaper Publishers Association.

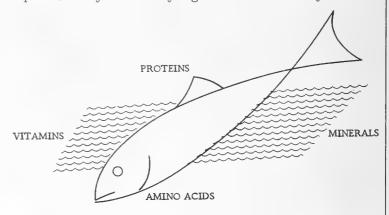
The newspaper participating in this ambitious undertaking supported the twoweek campaign with ads which ran into thousands of pages and hundreds of thousands of lines of advertising copy. Added to this was the potent point-of-purchase support of the retail food industry, the advertising and merchandising support of food

manufacturers, and the promotional activities of wholesalers and brokers.

'Better Meals' means nutritionally-balanced meals. Anutritionally-balanced meal is one which supplies the body's requirements for protein, fat, essential minerals and vitamins. Fishery products are a source of animal protein. Such proteins are nutritionally complete. They are easily digestible and readily avail-

able to the body for construction and repair of body tissue. They contain generous quantities of each of the essential amino acids necessary to good health.

Fishoils are uniquely well fortified with more of the unsaturated fatty acids than are vegetable fats or land-animal fats. Fish fat is easily digested and readily used by the body tis-



sues. Those fatty acids tentatively classed as being essential include linoleic, linolenic, and arachidonic. These three essential fatty acids are necessary in the diet to permit growth, and reduce skin disorders.

Fish, within the approximate 240 marketed varieties and their numerous market forms, supply to the diet any degree of fat desired, whether it be that of such species as the very lean cod, haddock, halibut, or shrimp; or that of the numerous intermediate group composed of such species as salmon, tuna, oysters, crab, lobster, yellow perch, or flounder.

COMMERCIAL DEVIEW FISHERIES NEVILW

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FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE ARNIE J. SUOMELA, COMMISSIONER

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF INDUSTRIAL RESEARCH
AND SERVICES

HAROLD E. CROWTHER, CHIEF



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, May 21, 1957.

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SHRIMP EXPLORATION BY THE M/V OREGON ALONG THE NORTHEAST COAST OF SOUTH AMERICA $^{1/}$

By H. R. Bullis, Jr.* and J. R. Thompson**

SUMMARY

Two cruises of the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were made, during the fall of 1957 and the late summer of 1958, off the Northeast Coast of South America. The primary objective was to obtain preliminary data on the shrimp resources of that region. The first cruise covered the

general region extending from Trinidad to the mouth of the Amazon River, and the second cruise was largely devoted to a more detailed investigation of a smaller area off the coasts of British Guiana, Surinam, and French Guiana.

Commercial quantities of pink shrimp were found off the Guianas with optimum catches near the 30-fathom curve. The best night's fishing resulted in 576 pounds (heads-on) 6-10 count pink shrimp, off the Surinam River, obtained by dragging two 40-foot flat trawls simultaneously.

Brown shrimp were less common and scattered. Best catches amounted to 30 to 40 pounds (heads-on) per one-hour drag. Sea bobs were prevalent in waters shallower than 16 fathoms.



Fig. 1 - The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Only small amounts of deep-water shrimp species were taken, although three species, royal-red shrimp, "scarlet" shrimp, and Solenocera vioscai, were found to inhabit the entire deep-water region.

Limited quantities of small red snapper were found in 31 percent of the drags made inside 50 fathoms. Lane snapper and a variety of other fishes, including sea catfish, sea trout, and croaker-like species, were also found in abundance in shallow waters.

1/A condensed version of this report appeared in The Fish Boat, July 1959.

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Branch of Exploratory Fishing and Gear Research, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, Pascagoula, Miss.

Good trawling bottom is present in most areas of the coast out to the 50-fath-om curve. The bottom generally consists of soft mud out to 20-25 fathoms and a mixture of mud and sand from 25 to 50 fathoms. Beyond 50 fathoms an extensive zone of rough coral and rock bottom extends, in many localities, to the edge of the continental shelf.

BACKGROUND

The long-range operating capability and over-all efficiency of the shrimp fleet of the Gulf and Southeastern States has been steadily increasing in recent years, as has the number of vessel units involved. Up to the present time, with few exceptions, this dual increase in fishing power has been absorbed by the present established fishery on previously delimited fishing grounds. Many vessel operators have expressed alarm over what they term the "excessive fishing pressure" exerted on the grounds by these factors and have sought ways of easing the situation. One way of alleviating that pressure seemed to lie in the discovery of new shrimp grounds. By 1957, however, most trawlable areas of the continental shelf along the Gulf and southeastern United States coasts, in waters of less than 25 fathoms, had been explored for shrimp by Federal, state, or commercial vessels. There seemed little indication that extensive new areas would be added following the discovery of the Tortugas (Idyll 1950) and Campeche pink-shrimp beds. It thus became clearly apparent that, if new shrimp beds were to be found, exploration must be conducted outside the present range. The lessening importance of previously-imposed limitations of time and distance, brought about by increased range and working ability of modern vessels, made such a step practicable. Exploratory fishing, outside the existing commercial range, can take two forms; vertical and horizontal extension.

Work in the Gulf of Mexico and off the southeast coast of the United States by the U. S. Bureau of Commercial Fisheries extended vertical exploratory and production-type shrimp coverage out to depths of roughly 180-350 fathoms, using Bureau owned and chartered vessels Oregon, Pelican, Combat, and Silver Bay. That work resulted in the discovery of a new potential, the royal-red shrimp (Bullis 1956, Bullis and Rathjen 1959).

Geographically, the waters over the continental shelf of the northeast coast of South America, roughly from Trinidad to the Amazon River, constitute a vast region which has received, at best, only meager shrimp investigation. Accounts of the limited surveys that had been made in restricted areas off the Amazon River and the Guianas varied, and, in most cases, could not be traced. The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon therefore completed two cruises in international waters off this coast to obtain preliminary information

Table 1 - M/V Oregon South American ExplorationDistribu-				
tion of Trawl Drags by Depth				
Depth Interval	No. of Drags			
<u>Fathoms</u>				
0- 50	218			
51-100	21			
101-150	22			
151-200	14			
201-250	10			
251-300	6			
301-350	3			
351-400	1			

on possible shrimp resources. Oregon cruise 47, made in the late fall of 1957, covered the region from Trinidad to the Amazon Delta with 113 exploratory drags. A total of 71 drags was made in the 10- to 100-fathom-depth range and 42 drags were made in 100- to 400-fathom depths.

The work carried out on cruise 53, during the late summer of 1958, was more restricted in depth and area, and it extended from Trinidad to the coastal waters of Cayenne, French Guiana, with major emphasis on explorations off the coast of the Guianas. Ninety percent of the 182 drags were made in water of less than 50 fathoms.

The number of drags made in various depths during both cruises is show in table 1. Figure 2 shows the location of the drags made during both cruises.

GEAR AND FISHING METHODS

Most of the trawling was carried out with 40-foot-flat shrimp trawls, using either bracket or chain doors on 15- to 25-fathom bridles. Tickler chains were used during most of the work on the second trip with encouraging results. A single trawl was used for most exploratory dragging, but double-trawl rigs also were operated in a few areas to more closely tie in the results with accepted Gulf of Mexico commercial trawling practices. Larger trawls, varying from 65 to 100 feet inhead-rope size, were also tried; but resulting catches did not compare favorably with catches made with two 40-foot nets towed simultaneously on the same grounds, and use of the large nets was discontinued.

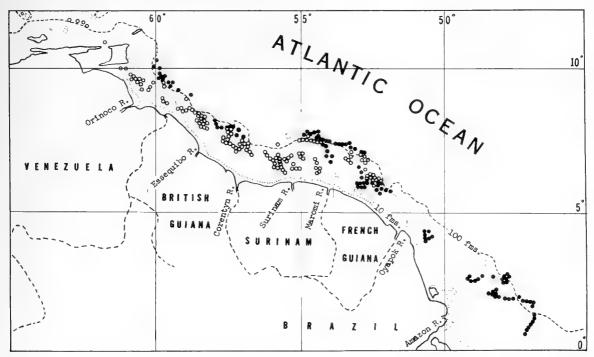


Fig. 2 - Exploratory trawling drags by the M/V Oregon off northeastern South America. Black dots show positions fished on first cruise. Circles, positions on second cruise.

During exploratory trawling it was noted that length of drag resulted in a notice-able change in catch rate. Although the varying trawling conditions did not allow proper statistical evaluation of the catches, the rates from one-, two-, and three-hour drags, in most cases, showed a marked shrimp-catch increase per hour between the one- and three-hour drags. This, presumably, might result from the length of time it took the net to reach a "stabilized" fishing position.

The amount of warp used in relation to water depth was not constant, as strong and variable currents necessitated constant drag-to-drag modifications of this factor.

FISHING CONDITIONS

Current created the most important trawling problem encountered. Strong currents occurred in the more desirable fishing depths, between the 20- to 40-fathom curves. Conditions were poorest off Cayenne, where estimated current speeds of 5 to 6 knots permitted only countercurrent dragging. In spite of promising signs of shrimp in the Eastern French Guiana area, time did not permit an adequate solution to the problem of trawling in the strong current.

Sea and weather conditions during both cruises were favorable for shrimp trawling; and information received from authorities in Surinam indicates that heavy seas, which would stop fishing activities, are infrequent. The period of worst weather extends from January through March, when the fresh to strong northeast trade winds are said to blow continuously.

Bottom types varied from area to area, but generally conformed to soft mud inside of 20 to 25 fathoms; sand, mud, and broken shell out to 50 or 60 fathoms; and rock, coral, gravel, and sand extending from there to the limits of the continental shelf. Occasional patches of hard bottom were encountered in the more desirable shrimp ranges (inside of 50 fathoms), but the entire range was, for the most part, trawlable. During the extensive work carried out during cruise 53, no gear was lost due to bad bottom.



Fig. 3 - Sorting out the shrimp from a trawl catch off the Surinam coast aboard the M/V Oregon.

Shore facilities for taking on ice and fuel, and for freezing and storing the shrimp catches are, at present (1959), not sufficient to withstand the sudden influx of a large fleet. Surinam, British Guiana, and Trinidad are presently increasing their capacities in this direction, and all three, in addition to Cayenne, French Guiana, would make suitable bases for shrimp operations if future developments substantiate the indications of a potentially large, year-round fishery.

FISHING RESULTS

PINK SHRIMP: The South American pink shrimp (Penaeus brasiliensis), is very closely related to the pink shrimp of the southern United States, P. duorarum. Pink shrimp represented the largest commercial potential observed during the two cruises. The species was found over a broad area extending from Venezuela, along

the Guianas, to the Brazilian coast north of the Amazon River, in waters ranging in depth from 16 to 50 fathoms. While apparently not present in the dense concentrations which marked the early Campeche shrimp fishery, the pink shrimp, nevertheless, seemingly, could provide the basis for a steady, year-round fishery. Local authorities have noted that there is apparently little seasonal variation in catch rate, but they believe that additional work on a year-round basis is desirable to verify this.

Best <u>Oregon</u> catch rates were obtained in close proximity to major drainage systems of the coast; the Orinoco, Essequibo, Corentyn, Surinam, and Maroni River systems. The areas off the Oyapok and Amazon Rivers were not sufficiently explored to determine their importance. Catch rates in areas extending out from these drainages averaged two to four times as large as in the intermediate areas.



Fig. 4 - Pink shrimp from the Guianas. These shrimp averaged 16-20 count, heads-off.

Best fishing was found as the 30-fathom curve was approached, and shrimp catches dropped sharply on either side of this depth. Almost all catches were composed of medium to large (21-25 to 6-10 count \(\frac{1}{2} \)) shrimp. A general tendency toward increase in size of individual shrimp with increasing depth was noted. From 16 to 25 fathoms, catches of less than 10 pounds of 21-25 and 16-20 count shrimp per hour were usual; whereas in the depths between 25 and 35 fathoms, the average for all exploratory drags rose to over 20 pounds per hour of mostly 16-20 count shrimp. In the latter depth range, in three areas--off the Essequibo, Surinam, and Maroni Rivers--nightly catch rates using two 40-foot flat trawls usually amounted \(\frac{1}{2} \) Counts represent the number of heads-off shrimp per pound.

to about 500 pounds of heads-on shrimp (16-20 count). The best night-long catch was off the Surinam River when 576 pounds (heads-on) of 6-10-count pink shrimp were landed. In 45 to 50 fathoms only small numbers of large (6-10 count) female shrimp were caught.

In general the pink shrimp grounds, from the Orinoco to the Oyapok Rivers, afforded good trawling bottom consisting chiefly of a mixture of mud and sand. Small patches of coral and sponge were occasionally encountered, but gear damage was slight, as those areas were easily detected on the depth recorders. The bottom in most areas changed character in waters deeper than 50 fathoms and became considerably rougher; however, pink shrimp were apparently absent, or only infrequently met with, in the deeper area. Inside 10 to 15 fathoms, the great quantity of industrial fish interfered with shrimping operations. The best trawling grounds, thus,



Fig. 5 - Removing heads from shrimp preparatory to boxing and freezing.

correspond well with the highest observed pink-shrimp concentration. The shrimp grounds extend quite far from the coastline. The position of the 20-fathom curve lies from 20 to 35 miles offshore, in most cases.

As in the Gulf of Mexico, pink shrimp catches fell off at, or before, daylight; and daytime trawling was unproductive for this species. Major attention was, therefore, focused on fishing from late afternoon to dawn.

While it is probable that the pink shrimp grounds have been roughly delimited by these cruises, considerable additional work would be necessary to accurately define the boundaries of the most productive fishing areas.

BROWN SHRIMP: Sporadic catches of brown shrimp (Penaeus aztecus), were made at widely scattered points along the Northeastern South American coast. Brown shrimp were included in Oregon drags over a total depth range extending from 10 to 50 fathoms, although beyond 40 fath-

oms the quantity caught was considerably less. In the 25- to 30-fathom range they were frequently taken along with pink shrimp. In contrast to the catch rates for brown shrimp in United States waters, the catch rates for brown shrimp along the South American coast did not show any marked fluctuation between day and night catches. They were found predominantly on muddy bottoms. Best catches amounted to 30 to 45 pounds per hour (heads-on) with a 40-foot flat trawl off the coast of British Guiana. The largest night-long catch of brown shrimp was made in 28 to 30 fathoms off the Essequibo River when about 325 pounds (heads-on) were caught mixed with about 175 pounds (heads-on) of pink shrimp. In size, the brown shrimp ranged from 56-60 to 16-20 count, averaging about 26-30 count.

SEA BOBS AND MISCELLANEOUS SMALL INSHORE SHRIMPS: Very little exploration in less than 10 fathoms was made by the <u>Oregon</u> due to time limitations and the earlier indications of offshore concentrations of brown and pink shrimp.

The sea bob (Xiphopeneus kroyeri), forms the basis of a very important local fishery in Surinam. It is caught locally by means of set nets suspended from stakes in the river mouths. Sea bobs apparently are seasonally available in vast quantities, in the estuarine areas and coastal regions, out to a depth of approximately 15 fathoms. The major portion of the present production is dried and packaged for export.

A small number are headed, handpeeled, and frozen at Paramaribo. The Oregon obtained catches of sea bobs over a depth range of 7 to 15 fathoms. The prevalence of large quantities of "trash," including a high percentage of such undesirable elements as jellyfish, sting rays, and saw fish, might cause a sea-bob trawl fishery to meet with serious drawbacks.

A few other shallow-water shrimp species are present in the region and are utilized to some extent as a source of dried shrimp. These, however, are even smaller than the sea bob, varying in size from 100 to 500 (heads-on) shrimp to the pound. In this group are included Hippolysmata sp. and Palaemon sp. One Oregon drag resulted in 130 pounds of the two small



Fig. 6 - Washed shrimp tails being packed in 5-pound freezer cartons.

shrimp species. Apparently these forms are most concentrated in the areas around large river mouths. Oregon catches of the small shrimp known locally as "fine shrimp," were made along the Brazilian coast off Maraca Island at the mouth of the Amazon River and off the Surinam River.



Fig. 7 - Storing the boxed shrimp in one of the Oregon's 15-ton freezers.

Penaeus schmitti: Similar to its counterpart (P. setiferus) in the Gulf of Mexico and southeastern United States, the South American P. schmitti is closely restricted to shallow-water areas and is an inhabitant of the bays and estuarine regions that were inaccessible, for the most part, to the Oregon. Small amounts of these shrimp were taken at four Oregon stations in 15 to 26 fathoms. This species apparently is commonly found in the tilapia culture ponds of Surinam where it reportedly reaches a large size. It is known locally as a white or blue shrimp and has the general appearance of the white shrimp common to southeastern United States coastal areas except that it has a purple "tail."

<u>Deep-Water Shrimp</u>: The previously-mentioned shrimp are considered shallow-water or coastal in relation to a second group of deeper, offshore dwellers. The two groups are more or less sharply separated by a band lying between 50-60 fathoms and 85-100 fathoms, in which few shrimp of any commercial, or potential-

ly-commercial, importance have been found. Among the numerous species of shrimp inhabiting the deeper waters, three stand out as possible commercial resources: Solenocera vioscai, Plesiopenaeus edwardsianus, a large scarlet shrimp; and Hy-menopenaeus robustus, the royal-red shrimp.

Solenocera vioscai were found over a range of from 95 to 160 fathoms. Only subcommercial catches were found during the present explorations with best catches running from 6 to 10 pounds (heads-on) per one-hour drag. The area of greatest concentration, as found by these limited explorations, was off the Surinam coast within the depth range mentioned. These shrimp averaged around 55-60 count.

Few royal-red shrimp were taken, although the stations made in the royal-red shrimp depth range (roughly 185-350 fathoms) pointed to the existence of that species along the entire coast. The best catch occurred north of Trinidad in 185 to 200 fathoms. A total of 75 pounds (heads-on) of large 16-20 count royal-red shrimp was taken in a one-hour drag with a 40-foot shrimp trawl on a blue-mud bottom in that area.

Plesiopenaeus edwardsianus, large deep-water scarlet shrimp, were taken in small amounts over a total depth range extending from 185 to 400 fathoms. Best catches were made in the 300- to 400-fathom range where catch rates ranged from 10 to 25 pounds (heads-on). This species is an active swimmer and it is likely that the standard flat trawl with its relatively low vertical opening is not suited to cope with a species displaying this ability.

FISH: Small numbers of red snapper (Lutianus aya) and lane snapper (L. synagris) were taken in shrimp trawls along the entire coast within a depth interval of 15 to 52 fathoms. Thirty-one percent of the stations occupied within that depth range included small catches of red snapper. Average snapper catches ranged from two and one-half to three pounds, with individual fish ranging generally from one-half to two pounds. Largest single catch was 20 pounds.

Lane snapper were present in 29 percent of the drags made within the same depth range. Catches and individual fish weights closely paralleled those given for red snapper.

The presence of snapper in this percentage of shrimp-trawl drags indicates commercial possibilities on neighboring rough bottom where shrimp trawls cannot be used. Sporadic local attempts have been made in the past to develop a snapper fishery along the coast; but lack of continuing interest, lack of experienced personnel, and lack of suitable vessels interfered with most previous trials. An active snapper fishery has been in existence off British Guiana for some time.

Miscellaneous fish species caught in the shrimp trawls included several marketable varieties. <u>Sciaenids</u>, so far unidentified as to species, were common. They included croaker-like fishes that averaged about one pound, and sea trout that weighed from 2 to 4 pounds.

Spanish mackerel were observed along the coast of British Guiana in surface schools over the 20- to 40-fathom range. On a few occasions, while working that section of the coast, Spanish mackerel were caught in the shrimp trawls.

Depth recorder traces of several other schooling species were observed. Identity of the school components was checked by trawl catches and they included; thread herring (Opisthonema), scad (Decapterus), Spanish sardines (Sardinella), and several species of anchovies.

CONCLUSIONS

The work carried out by the explorations has established the fact that marketable shrimp species of valuable sizes are found over most of the coastal region of Northeastern South America, and that concentrations appear in several broad areas. Additional exploration will be required before the areas of highest production can be precisely delineated.

Pink shrimp constituted the most important species found, from a commercial standpoint, with brown shrimp and \underline{P} . schmitti secondary. Since the basic objective of these trips was of an exploratory-survey nature, and the area that was involved was large, intensive work in any restricted region within the time allotted was precluded. The results obtained should, therefore, be reviewed with the thin exploratory coverage necessarily accorded the area in mind. The possibility exists of heavier concentrations, particularly of pink shrimp, on yet-to-be-discovered grounds.

The major trawling problems include a strong and variable current over most of the trawling grounds, and the general unfamiliarity with bottom conditions.

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CONSUMERS SPEND ONE-FOURTH OF FOOD DOLLAR "AWAY FROM HOME"

Did you know that an increasing share of the nation's food is being marketed by "away-from-home" food-service establishments? These include restaurants, in-plant cafeterias, hotels, schools and colleges, and a number of other types of eating places. According to a recent report issued by the U.S. Department of Agriculture in 1959, about one-fourth of the consumer's food dollar, on the average, is spent for food served away from home.

The Agriculture report is based on a survey of operating policies and practices of some leading institutional wholesalers who are suppliers of food-service establishments. This study analyzes some of the many changes that are under way or can be initiated by the wholesalers to make their operations more effective and more profitable by reducing costs.

A free copy of the report is available from the U.S. Department of Agriculture, Office of Information, Washington 25, D.C. It is Market Research Report No. 335, "Policies and Practices of Some Leading Institutional Wholesale Grocers."

INFLUENCE OF VESSEL-HANDLING PRACTICES ON FORMATION OF BLACK SPOT IN SHRIMP¹/

ABSTRACT

Handling practices were observed aboard commercial shrimp boats fishing in the Dry Tortugas and the Campeche areas. Experiments were designed to test the effect of a number of factors on the incidence and amount of black spot on shrimp during storage. The factors considered were: (1) length of drag, (2) washing shrimp on deck, (3) bruising shrimp, (4) removal of heads, (5) delay in icing, (6) method of icing, (7) type of ice, and (8) position in storage pen. All shrimp were stored in ice except for a small portion of each sample which was held in frozen storage for 8 to 12 months to test the effect of this factor on incidence of black spot.

Delay in icing the shrimp below deck markedly increased incidence of black spot. Natural variation in the pattern of black-spot development and difficulty in separating the individual effects of the numerous handling factors necessarily present in every test series, tended to obscure the influences of the other factors studied. There were indications that the following factors, alone or in various combinations, tended to increase black spot during storage: (1) long drags, (2) bruising of shrimp on deck, (3) storage of shrimp without washing, (4) storage of shrimp with heads on, and (5) poor icing practices. The type of ice used, the method of icing, position of shrimp in the pen, or frozen storage of shrimp up to a year were not associated with differences in the incidence of black spot.

Black-spot development on shrimp stored in ice cannot be eliminated by improvement in handling practices, but rapid icing and careful handling can reduce the incidence of black spot, and will at the same time maintain quality and prolong storage life of the product.

INTRODUCTION

Black spot on shrimp is a condition characterized by the appearance of black zones or spots usually at the edges of the shell segments. The dark color is produced by melanin pigments which form on the internal shell surfaces or, in advanced stages, on the underlying shrimp meat. These pigments are produced by an oxidative reaction of tyrosinase on tyrosine. The reaction is accelerated by copper and other metallic ions (Bailey and Fieger 1954).

Formation of black spot has been observed on all species of shrimp landed from waters contingent to North America, and probably is a world-wide problem. Observations would lead to the belief that the problem is more severe with some species than with others. The amount of black spot on the shrimp, as landed, largely determines the grade of the shrimp and the price the fishermen receive for their catch. The price for shrimp with considerable black spot may be cut from 2 to 10 cents a pound.

It has been thought that black spot on shrimp develops as a result of poor handling or prolonged storage in ice, but there actually has been little or no investigation of the specific factors that result in the formation of black spot. The purpose of this investigation was to determine whether changes in the way the shrimp are handled on the boats could eliminate or at least reduce the incidence of black spot. Specifically, the objectives of the research were (1) to observe commercial practices of handling shrimp on the boats, and during ice and frozen storage to determine the factors that may affect black-spot formation; and (2) to suggest modification in the commercial methods of handling and storing shrimp in ice to reduce the rate of black spot formation if, in fact, handling practices are associated with formation of black spot.

1/This research was conducted by the Marine Laboratory of the University of Miami under a contract let by the U. S.

Bureau of Commercial Fisheries. Funds were provided by the Saltonstall-Kennedy Act of 1954.

Note: This manuscript was prepared by Charles F. Lee, Fishery Technological Laboratory, U. S. Bureau of Commercial

Note: This manuscript was prepared by Charles F. Lee, Fishery Technological Laboratory, U. S. Bureau of Commercial Fisheries, from the final contract report by the research investigators, Clare P. Idyll and James Alexander of the Marine Laboratory, University of Miami, Coral Gables, Fla.

OBSERVATIONS ON COMMERCIAL FISHING PRACTICES

Fishing was observed in two localities: the Dry Tortugas and the Campeche Grounds.

DRY TORTUGAS: Most of the shrimp taken in the Dry Tortugas are landed at Key West, Fla., although smaller numbers of boats may land catches at Marathon, Everglades, Fort Myers, Tampa, and other ports on the west coast of Florida. Most of the trawlers used in this fishery are relatively small, averaging about 50 feet in length, and have noninsulated holds. The gear used is a modified otter trawl. Until recently, most of the boats used a single net. Now many boats use a "double rig" in which two nets are fished simultaneously, one on each side of the vessel.

The average duration of a trip to the Tortugas is about five days. The boats seldom are more than a 10-hour run from their home port. From some ports, the boats may start fishing within 2 hours from the dock. The amount of ice carried is dependent upon the intended duration of the trip. For a 5-day trip, 3 to 5 tons of ice may be carried.

This is a night fishery, and drags may last from 1 to 8 hours, depending on the nature of the bottom, the weather, and the abundance of shrimp. The trawl bag is emptied on deck, and the trawl is reset before the shrimp are sorted from the unwanted material in the catch. This material, usually called "trash," consists of varying amounts of small fish, crustacea, sponges, mollusks, and mud. The ratio of trash to shrimp varies greatly, but in the Dry Tortugas area it is commonly about 2 to 1.

Most of the shrimp are "headed" before being iced, but it is not Fig. 1 - Shrimp showing different stages of black spot development. uncommon to ice and bring shrimp Black spot on the shrimp develops during storage when shrimp are improperly with heads on, particularly properly handled on the boats. If most of the shrimp are small or if the catch is heavy. It is not the usual practice in this area to wash the shrimp after the heads have been removed. Icing practices are variable. Some fishermen store the shrimp in the hold in baskets covered with a small quantity of ice but most fishermen ice the shrimp in pens. The pen floor is covered with about 6 inches of ice, and more ice is added and mixed with the catch, using a blunt-tined rake.



The promptness with which the shrimp are sorted from the trash, the heads removed, and shrimp iced below decks also varies widely, depending largely on the

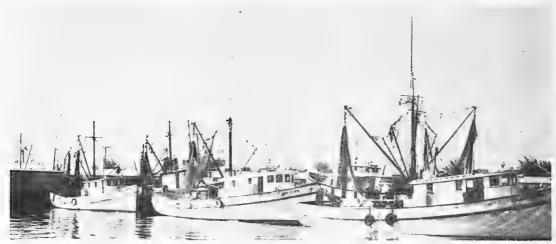


Fig. 2 - Shrimp boats at dock in port of Tampa, Fia.

habits of the fishermen. Under ideal conditions, the shrimp may be iced within 30 minutes, but delays of as much as 4 hours on deck have been observed.

To unload the boats at the port of Key West and at most of the smaller ports, the fishermen shovel the shrimp-and-ice mixture into a large basket, which then is hoisted to the dock and dumped into a de-icer wash tank. The de-icer is simply a rectangular galvanized tank of water with a mesh conveyor belt on one end, which serves to carry the shrimp to a sorting table.

CAMPECHE GROUNDS: Large shrimp grounds are located near Campeche, off the Yucatan Peninsula, Mexico. International waters here are fished by United States boats and those of several other nations. Most of the shrimp taken by United States boats in this area are landed at the port of Tampa, Fla. The boats average about 70 feet in length and have well-insulated holds. The average trip from the Florida west coast may last from 50 to 60 days, and a supply of ice and fuel is taken by the boats at the beginning of the trip, sufficient to last this time. More than 30 tons of ice generally is required. The distance from Tampa to the fishing grounds is approximately 800 miles, so the trip across the Gulf of Mexico takes 3 to 4 days.

Fishing operations differ somewhat from those at the Dry Tortugas area. Most of the boats fishing Campeche grounds now use the double-rig gear. Drags are shorter--rarely more than 4 hours; shrimp heads always are removed; the shrimp usually are muddy and are thoroughly washed with a deck hose to remove mud; handling on deck is more rapid; and a larger ratio of ice to shrimp is used. One factor facilitating more rapid handling of the shrimp on deck is a generally lower amount of trash, which may amount to about one-third of the average catch or about half as much as in the Dry Tortugas area.

As already stated, the shrimp boats near Campeche stay on the fishing grounds for long periods, but most are not equipped to freeze the catch. Consequently, the iced shrimp must be returned to port frequently, usually every five days. This is done by other vessels of the usually large fleet in the area that have completed their trips. These returning vessels fill up their holds with the catch of several other shrimp boats.

The transferring operations usually take place on "The Flats," a shallow area west of the port of Campeche. The vessels whose captains want to send their catch

home transfer the mixture of shrimp and ice from one hold to another in large mesh bags holding about 300 pounds. In the hold of the returning vessel the catches of the different boats are separated by pieces of webbing, and the entire pen loan is capped with a heavy layer of ice. The hold of the returning boat usually is not opened until arrival in port in order to make the ice last longer.

Most of the plants in Tampa use a bucket elevator-conveyor that can be lowered into the boat hold to unload the shrimp. This method of unloading results in less damage to the shrimp than does the use of the shovel-basket hoist.

METHODS AND MATERIALS

The following experimental variations were introduced into the methods of handling and storage of shrimp aboard the boat and in the laboratory to observe their effect on incidence of black spot:

- 1. Length of drag--observations were made of shrimp taken in drags lasting for 2, 3, 4, 5, and 6 hours.
- 2. Washing shrimp on deck--a comparison was made with shrimp stored in ice without previous washing.
- 3. Bruising--some of the shrimp were deliberately bruised on deck, and compared with others of the same lot that were handled carefully.
- 4. Removal of heads--some shrimp were stored in ice with heads on and compared to others of the same lot from which heads were removed before storage.
- 5. Delay in icing--observations were made of black spot incidence during storage of lots of shrimp that had been exposed on deck before being iced. A portion of the lot was iced promptly, then other portions were iced after periods of exposure varying from 1 to 6 hours.
- 6. Method of icing--the usual method of mixing shrimp and ice was compared with icing the shrimp in layers.
- 7. Type of ice--finely crushed "snow" ice was used on board the boats. However, in one test the shrimp were stored in the laboratory in coarse, medium, and finely crushed ice to determine if particle size affected the rate of black spot formation. In another test, a special aerated ice was compared with the regular non-aerated ice.
- 8. Position of shrimp in the pen--portions of the catch that had been iced near the front, in the middle, and at the rear of the pen were separated as they were removed from the hold, to observe differences due to pen position on the incidence of black spot during subsequent storage.
- 9. Frozen storage--a portion of each lot of shrimp was packaged and placed in storage at +5° F. immediately after arrival at the laboratory. Some lots were observed after 4, 8, and 12 months to determine if storage resulted in increased incidence of black spot.

The shrimp used were pink shrimp, Penaeus duorarum, obtained from commercial vessels fishing in the Tortugas and Campeche areas. The experimental samples of shrimp were well-iced in the vessel hold in separate boxes and were iced on the truck en route from Key West or Tampa to the Marine Laboratory in Miami. Only three 10-oz. packages from each sample were frozen for the storage studies. Five to seven pounds of each sample were held for 14 to 17 days in ice in a cool room. A portion of each of the iced samples was removed for evaluation of

black spot every 2 or 3 days. The black spot evaluations were made by experienced laboratory personnel. Ten shrimp were examined and graded for amount of black spot on the basis of five for no black spot and a reduced score as black spot increased. Black spot was evaluated with both shell-on and peeled shrimp, and a permanent photographic record was made of each test lot.

RESULTS AND DISCUSSION

The condition known as black spot, sometimes called melanosis, of shrimp develops during iced storage even under optimum storage conditions. However, it is evident from examination of even a single lot of iced shrimp that black spot does not affect the lot uniformly. Perhaps the most remarkable fact about black spot is that in any given lot of shrimp stored in ice some shrimp will show no more than greyish markings under the segment edges while a few others will be badly discolored with black spot and most will show intermediate stages of discoloration. The reasons for this difference in individual susceptibility to black spot are not known.

Even when the black spot scores for 10 shrimp are averaged, this variability makes it difficult to detect the effect on rate of black spot development of experimental variations in handling practices.

For example, the average initial scores for black spot, rated on arrival at the laboratory 2 to 4 days after the shrimp were caught, ranged from a perfect 5.0 (these are called "pearls" by the industry) to 3.5. On the other hand, after 14 to 17 days of storage in ice the range of black spot scores was only 4.0 to 2.5. Thus some lots of shrimp started out the tests with more black spot than other lots had at the end of the test period. Further evidence of this unaccountable difference from shrimp to shrimp and lot to lot was the observation that frequently the minimum black spot scores were not recorded at the end of the storage test period. Several of these low average scores were recorded on the ninth day, and one on the seventh day after the shrimp were caught.

Factors not subject to experimental control, such as ratio of shrimp to trash, and the amount of shrimp in the trawl may contribute to these irregularities. However, when the normal handling of any trawl load of shrimp involves six or seven of the test variables, it is impracticable to design an experimental series and obtain a sufficient volume of data to permit statistical separation of all these interacting effects. As a result only very strong influences on black spot development, such as delay in icing the shrimp, have an effect which is definitely noticeable, in spite of natural variability and the maze of compensating handling factors.

This should be considered in the following discussion of the effect of each of the handling factors studied on development of black spot.

LENGTH OF DRAG: There was no consistent relationship of length of drag to amount of black spot. Although samples from the 2-hour drags showed less black spot development during subsequent ice storage, the shrimp from the 3- and 4-hour drags showed more black spot than did those dragged 6 hours. However, the 3- and 4-hour drags had a much higher percentage of trash (86 and 93 percent) than the 2- and 6-hour drags (25 and 44 percent). Possibly a heavy load of shellfish, fish, sponge, and other trash in the net may bruise the shrimp and accelerate black spot formation more than the factor of drag time alone.

WASHING: Washing the shrimp on deck did not reduce the amount of black spot significantly as compared to the unwashed samples in these trials. It should be noted, however, that the Tortugas shrimp used in this test had relatively little mud on them.

BRUISING: Deliberate bruising of the shrimp did not definitely increase the amount of black spot. This variable was investigated in combination with the washing studies and variation in length of drag which made it difficult to interpret the results, that is, the individual effects of the various factors could not be separated with the limited amount of data available.

REMOVAL OF HEADS: Shrimp heads are usually removed before the shrimp are iced, except when the shrimp are very small, or catch rate is very heavy. However, when heads were left on the incidence of black spot during storage in ice was not consistently or significantly increased so as to be apparent as a separate effect among the effects of other handling practices.

DELAY IN ICING: The interval from the time the shrimp are removed from the water until they are iced below deck was found to have the most positive relationship of any of the factors studied to the amount of black spot developing during storage. Shrimp that were iced immediately developed the least black spot, and the incidence of black spot increased for other portions of the same net load of shrimp in a direct relation to the time the shrimp were permitted to lie exposed on deck.

Measurement of temperatures at various positions in the piles of shrimp on deck showed some increases at the top of the pile, especially when exposed to the sun. On the other hand, a strong wind caused a drop in temperature initially at the top of the pile due to evaporation. Thus it was not practical to correlate the amount of black spot to position in the pile or temperature of the shrimp.

MANNER OF ICING: No difference in the amount of black spot that developed during subsequent storage could be demonstrated between two methods for icing shrimp in the hold. Most fishermen ice their catch by mixing ice and shrimp. Use of layers of ice and shrimp was equally effective in preserving quality if the layers of shrimp were not more than 3-4 inches thick and ample ice was used to maintain temperatures near 32° F. In either case a heavy layer of ice was first placed over the hold surface.

TYPE OF ICE: Crushed ice of medium size was used to store the shrimp in the laboratory except for two lots. Aerated ice, that is, ice that had been constantly aerated during freezing was used for one lot and in another test three different particle sizes of ice were used during the storage period. No significant difference in the rate of development of black spot was observed.

POSITION OF SHRIMP IN THE PEN: Observations were made of the temperature of shrimp at six positions in the pens in which the shrimp were iced. The temperature of the shrimp was reduced rapidly, from about 70° F. originally to 35° - 36° F. within an hour, and reached 32° F. within $4\frac{1}{2}$ hours. Layered icing was slightly more effective in maintaining the shrimp at or near 32° F. regardless of position in the pens. Actual position in the pen showed little effect on shrimp temperature as long as sufficient ice was maintained between shrimp and the rear hold surface and on the top. The pen position had no definite influence on the amount of black spot.

FROZEN STORAGE: Four of the lots of shrimp frozen immediately after arrival at the laboratory were examined after 4, 8, and 12 months' storage. Five of 29 samples showed a slight increase in black spot during this period. Three lots of samples stored for only 8 months showed no increase in black spot during this time.

PEELED SHRIMP: Since shrimp are never peeled on the boats, this was not an experimental variable. However, the shrimp were peeled in the procedure for evaluating black spot, and it was noted that most of the black discoloration was on the inner surface of the shell. Only when black spot was severe, and especially

when the shell had been injured or perforated, was the muscle tissue of the shrimp noticeably discolored.

CONCLUSIONS AND RECOMMENDATIONS

Natural variability in the incidence of black spot, and the fact that it was not practical to test the effect of the various handling practices individually, tended to obscure the effect of all but the very strong influences on black spot. Thus delay in icing of the shrimp was the only factor that showed a consistent and definite correlation to increased incidence of black spot. However, there was evidence in some of the test series that in various combinations long drags, excessive trash in the catch, bruising the shrimp, storage with heads on, failure to wash free of mud, and poor icing practices may increase the incidence of black spot during subsequent storage of the shrimp in ice.

To maintain optimum quality of shrimp on board the fishing vessel and to keep black spot at a minimum during ice storage the following recommendations are made:

- 1. Keep time of drag short, particularly when fishing in areas where ratio of trash to shrimp is high.
 - 2. Separate shrimp from trash as soon as possible.
- 3. Remove heads and wash the shrimp free of mud and other extraneous material.
 - 4. Avoid bruising or crushing the shrimp as they lay on deck.
- 5. Get the shrimp below deck and iced as rapidly as possible after the net has been reset. The shrimp may be iced either in layers or mixed with the ice, but the amount of ice should be adequate to maintain a cover over the hold surfaces and over the top of the pile of shrimp until the catch is unloaded at port.

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HEAVY CROPS OF PONDFISH CHANNEL CATFISH

Pondfish production records are being broken right and left since many U. S. Bureau of Sport Fisheries and Wildlife pondfish hatcheries are now engaging in the production of channel catfish. To be sure, artificial feeding sometimes supplements the natural and induced fertility of the pond water, but production records are still somewhat phenomenal, averaging between 400 and 800 pounds of catfish per surface acre at various stations during the season ended early in 1959.

FISH AND SHELLFISH PURCHASES BY PUBLIC SCHOOLS WITH FOOD SERVICES, 1957-58

By William S. Hoofnagle* and Kenneth E. Anderson*

The U. S. Bureau of Commercial Fisheries has long recognized that school lunchrooms represent one of the large potential outlets for fishery products. A substantial segment of the consumer educational activities of the Bureau has been directed toward the School Lunch Program. Fish-cookery demonstrations for supervisory school-lunch personnel are constantly and systematically being conducted by Bureau home economists and marketing specialists in all sections of the country. These efforts and effective industry follow-up have, in large part, contributed to increasing use of fishery products by schools for lunch programs.

--Editor's Note

BACKGROUND

The outlet for food in schools is an important segment of the away-from-home institutional eating market. Further expansion is likely to occur in this outlet as school enrollments continue to rise and as new schools are built with modern cooking and cafeteria facilities.

Through the school-lunch outlet, a medium is provided whereby new or improved foods may be introduced on a nationwide basis. In addition, children participating in

lunch programs are exposed to new foods or familiar foods in new form, learning at the same time how to select well-balanced meals and the importance of good eating habits.

School food service is widely recognized by educators and school administrators as an important part of the school program. Today, there are approximately 60,000 of the 106,000 public schools in the United States offering some type of food service, ranging from a complete plate lunch to à la carte service only. Somewhat over 54,000 of these public schools participate in the National School Lunch Program. This is a program, jointly administered by the U. S. De-



Fig. 1 - School lunchrooms are a large potential outlet for fishery products.

partment of Agriculture and State educational agencies, which provides food assistance to schools operating a nonprofit food service for children. Schools participating in the program receive food assistance in the form of cash and commodity donations to help them serve well-balanced, low-cost noonday lunches. To be eligible to receive this assistance, schools must agree to operate the lunch on a nonprofit basis; serve meals that meet specified nutritional standards; and serve free or at a reduced price to children unable to pay.

Deliveries of all purchased and donated foods to a national probability sample of 500 public schools were recorded over a 12-month period at 2-month intervals,

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beginning with July 1957 and ending with June 1958. The sample was divided into approximately 6 equal subgroups of schools, with invoices of deliveries taken in a rotating pattern to provide coverage in all months of the year so as to overcome seasonal factors. The value of deliveries was determined by using actual prices paid for food purchased by the sample schools and current market wholesale prices for donated foods. Information on the delivery invoices from the sample schools was tabulated for a 12-month period and projected to United States totals for deliveries and value on an annual basis. The Governments Division of the Bureau of the Census, under a cooperative arrangement with the Department of Agriculture, collected and tabulated the data reported herein.

TOTAL SCHOOL MARKET

The total value of foods, both purchased and donated, delivered to approximately 60,000 public elementary and secondary schools having a food service (either plate or a la carte) between July 1957 and June 1958 amounted to \$597 million, or \$28 per capita, based on average daily attendance figures of slightly over 21 million pupils. About \$505 million, or 85 percent of the total value of food, was purchased



Fig. 2 - A fish-cookery demonstration by a U. S. Bureau of Commercial Fisheries home economist to school-lunch personnel, Charles Town, W. Va.

by the schools from local sources. The remaining portion, or approximately 15 percent of the total dollar value of commodities, comprised those donated directly by the Government from purchases made especially for school lunch or from stocks acquired under various price-stabilization programs.

Schools participating in the National School Lunch Program received 94 percent of the total value of foods delivered to public schools having a feeding service during the survey period. In the case of directly-donated foods, almost 98 percent of the total value of those items went to schools operating under the National School Lunch Program.

TOTAL AND PER CAPITA QUANTITIES OF FISH AND SHELLFISH

During the survey period, July 1957 through June 1958, almost 28 million pounds of fish and shellfish were purchased by public schools having a food service. Based on an average daily attendance figure of a little over 21 million pupils in this category of public schools, about 1.3 pounds of fish and shellfish per child were available for consumption.

Of the total quantity of fish purchased by this market outlet, almost 15 million pounds were in fresh or frozen form. From a volume standpoint, fish sticks were the most important item in the fresh and frozen category, accounting for almost 6 million pounds. Fish fillets accounted for slightly over 4 million pounds and fresh whole fish about 1.5 million pounds, with the balance made up of other fresh or frozen fish items. On a per capita basis, 0.7 pound of fresh and frozen fish and fish products combined were available for consumption in the schools serving food.

Slightly over 13 million pounds of canned fish moved into the school market between July 1957 and June 1958. Tuna was by far the most important canned fish item, accounting for almost 8 million pounds. It was followed by salmon, which represented slightly over 4 million pounds of the total for canned fish items. Bonito, sardines, and other canned fish items accounted for the balance of the volume of deliveries in this category.

Shellfish was a relatively minor volume item in the school lunch program. Somewhat less than 200,000 pounds of shellfish items were delivered to these schools during the survey period. This may be attributed in part to the relatively higher cost of many of the items making up the shellfish group.

TOTAL AND PER CAPITA VALUE OF FISH AND SHELLFISH

The wholesale value of all fish and shellfish purchased by public schools with food services during the survey period amounted to almost \$13 million, or 60 cents per child, based on average daily attendance. From the standpoint of monetary value, canned fish items accounted for about \$7 million, or 32 cents per child. The value of tuna fish deliveries came to almost \$4 million, salmon to somewhat over \$2 million, and the balance was for bonito, sardines, and other canned items.

In the fresh and frozen category, the wholesale value of all items amounted to \$6 million, with fish sticks and fish fillets accounting for slightly over \$4 million of the total. Fresh whole fish was relatively the least expensive item in this category. Results of the survey revealed that fish and fish products accounted for 2 cents out of each school food dollar.

PURCHASES AND VALUE OF FISH AND SHELLFISH BY TYPE OF LUNCH SERVICE

Information on purchases and value of fish as well as other foods was collected by two categories of schools—those public schools participating in the National School Lunch Program and for all other public schools providing food services but not participating in the Program. The per capita quantity of fish and shellfish delivered to public schools participating in the National School Lunch Program was 1.4 pounds, compared with 0.8 pound in all other schools having a food service. The per capita value of fish and shellfish available for consumption in participating schools was 62

cents, compared with 38 cents in schools not participating in the National School Lunch Program.

SOURCE OF SUPPLY AND BUYING PRACTICES

To evaluate a market outlet, information must be obtained on its usual sources of supply and on buying practices followed in filling needed food requirements. In the survey, school food buyers were asked where they bought their fish supply as well as other individual food items. Over 99 percent of the expenditures made for fish by school food buyers were made at the wholesale level. Another interesting point with regard to the source of supply was the substantial expenditure made for fish through orders given to route salesmen. Small schools, that is, those having an enrollment of less than 300 pupils, utilize very extensively the route salemen in placing their orders for fish and fish products. Approximately one-fifth of the expenditures for fish products were made through competitive bids by obtaining price quotations from two or more suppliers before placing orders.

PER CAPITA USE OF FISH IN RELATION TO SCHOOL AND COMMUNITY CHARACTERISTICS

The per capita use of fresh, frozen, and canned fish was greater in elementary than in secondary schools. In large schools, those having a pupil enrollment of 300 or more, the rate of use of fresh or frozen fish exceeded that found in smaller ones; however, the situation was reversed in the case of canned products. Per capita use of fresh or frozen fish in schools serving areas where average family income was under \$4,000 was twice as large as that in schools serving areas where income was \$4,000 or larger. In contrast, the per capita use of canned fish items, namely tuna and salmon which are relatively expensive fish products, was considerably less in schools serving low-income areas as compared with schools located in neighborhoods where family income was \$4,000 or larger. A slightly higher per capita use of fish was found in schools located in communities of 2,500 people or less as compared with those located in more heavily populated areas.



THE INSTITUTIONAL MARKET

In 1957 Americans ate more than 80 million meals per day (at an annual cost of \$17.5 billion) in mass-feeding establishments of one type or another. According to a recent report in a leading frozen food journal, one-fourth of the 1957 American food dollar went for meals eaten outside of the home.

About 73 percent of the meals served each day by institutions were handled by restaurants, cafeterias, lunch counters, refreshment stands, hotels, hospitals, and industrial cafeterias. The rest were served by schools, transportation systems, drug stores, penal institutions, etc.

It is expected that by 1975 the annual volume of the institutional food market will approximate \$35 billion.

In 1957, the some 541,000 mass-feeding establishments in the United States spent about \$7.5 billion for food purchases. Of this amount, 35 percent went for meats, 12.5 percent for fruits and vegetables, 9.5 percent for fish and shellfish, and 9 percent for poultry. It is anticipated that by 1975 institutions will be spending some \$18 billion for food purchases.



CHEMICAL COMPOSITION OF PACIFIC COAST FISH AND SHELLFISH

A two-year study of the proximate composition of halibut meat was completed earlier this year. Long-term studies on rockfish and sole are nearing completion. Composition studies of cod, salmon, and sheepshead are being continued; and composition studies on tuna are still under way.

A report on variations in the composition of halibut meat was presented at the annual meeting of the Institute of Food Technologists in Philadelphia May 20. The paper is scheduled for publication in the May 1960 issue of Food Research. Halibut meat is low in oil and sodium, and high in protein, thus providing an excellent food for a wide variety of regular and special diets.



Vermilion Rockfish (Sebastodes miniatus)

During the 3-month period covered by this report over 200 specimens have been collected for analysis. They include sheepshead, rockfish, sole, cod, silver salmon, and tuna. The analyses on rockfish should be completed this year, and those on sole early next year. The silver salm-



Silver Salmon (Oncorhynchus kisutch)

on represent the first series in a proposed study of that species, following the same general outline as was employed in the study of pink salmon.

One week in April was spent at Terminal Island,

Calif., in the preparation of a second series of tuna samples for the tuna composition studies. Analyses have been completed on these samples, and tentative plans included the preparation of a third series in August, with the intent that a preliminary report on this first research phase can be available for presentation at the annual meeting of the Institute of Food Technologists in May 1960. The report on rockfish should also be ready for that meeting.

Analyses on two series of albacore have been completed. They represent frozen specimens from Japan, and iced specimens from Washington coastal waters. The fish are uniformly high in protein prior to precook averaging more than 25 percent. The Washington series had a much higher oil content than was found in the Japanese fish.

A preliminary study on the sodium content of raw commercially-frozen steaks and fillets from salmon, halibut, and rockfish has been completed. The results show that samples dipped in water before freezing have essentially the same sodium content as is found in the fish immediately after capture, but that samples dipped in a salt solution before freezing have a sodium content several times higher than is normally found in the meat of those species. A paper describing the sodium content of fish meat from time of capture to serving on the table, or on a patient's tray, was presented at the national meeting of the American Dietetic Association in Los Angeles, August 27. It is being published in the journal of that association.

Note: Also see Commercial Fisheries Review, August 1959, p. 13.

FREEZING AND COLD STORAGE OF PACIFIC OYSTERS AND FRESH-WATER FISH

Research on the cold-storage qualities of commercially-reared rainbow trout has been carried out by the Bureau's Seattle Fishery Technological Laboratory in a cooperative program with the Refrigeration Research Foundation. Freezing trout destined for retail and institutional trade is becoming an increasingly more important phase of the commercial trout industry. However, very little has been publish-



Rainbow Trout

ed regarding the storage life to be expected from the product. In order to supply cold-storage data for trout, a test was initiated to determine the cold-storage life at various temperatures.

Fresh rainbow trout purchased from a local trout farm were prepared in a manner being used by the industry to package frozen

trout. The fish were frozen at -20° F., then ice-glazed, and packed in polyethylene bags. The bags of ice-glazed trout were packed in waxed fiber cartons which were overwrapped with waxed kraft paper. Samples were stored at -20° F., $+10^{\circ}$ F., and $+20^{\circ}$ F. Fish from each temperature were examined on a regular basis to determine the maximum storage life that could be expected from trout stored at that temperature.

The results of the tests showed that the trout stored at $\pm 20^{\circ}$ F. were in acceptable condition up to 2.5 months of storage; those stored at $\pm 10^{\circ}$ F. were acceptable up to 4.5 months; those stored at $\pm 0^{\circ}$ F. or lower were acceptable at 16 months. Samples at $\pm 0^{\circ}$ F. and $\pm 20^{\circ}$ F. are being held for further examination. The limit of frozen storage is judged by the appearance and degree of rancidity of the sample.

NEW PRODUCTS FROM FISH OILS--MONOGLYCERIDES

Development of new products from fish oils is one of the objectives of fish-oil research of the Seattle Fishery Technological Laboratory. Fish oils are chemically unique as compared to animal and vegetable fats. They possess molecular characteristics such that application of certain chemical processes may be expected to result in the production of chemical derivatives not possible from these other fats.

Recent research has involved the synthesis of monoglycerides--used as emulsifiers and as intermediates in the production of certain detergents and plasticizers. The fish oils used were from sardine, herring, menhaden, pink salmon eggs, and tuna. During the development stage of the synthesis of fish-oil monoglycerides, several problems were encountered during the analyses and the determinations of their states of purity. Attempts were made to determine the purity of the products by analytical fractional distillation, using a molecular-type still. It was readily learned that fish-oil monoglycerides did not lend themselves well to such a distillation method. More recently, work has indicated that distillation of a monoglyceride derivative (the acetylated product) could very satisfactorily be distilled at the desired conditions. It was shown that such a physical separation analysis compared quite favorably with results obtained from chemical tests.

In the beginning of this investigation, it was not definitely known whether or not the conversion of fish oils to monoglycerides proceeded in a random manner. That is to say, did the fatty acid portions of the oil react in a manner that could be described as following a statistical probability pattern? If this was not the case for our synthesis of monoglycerides, then chemical tests were unreliable. However, it was shown by good agreement with the distillation data, that the chemical tests were valid. The conclusion was, therefore, that fish oils with their inherent range of fatty-acid chain lengths do not react in any selective pattern, but do react randomly. This conclusion substantiated other reports of a similar process involving vegetable oils.

Note: Also see Commercial Fisheries Review, August 1959, p. 15.

STUDY OF CHEMICAL COMPOUNDS FORMED DURING SPOILAGE OF FISH

A number of the classes of chemical compounds that could be present in spoiling fish have received little research attention. Some of these are neutral carbonyls, acidic carbonyls (keto acids), and esters.

Recently, the content of neutral carbonyls, keto acids, and volatile esters was determined in samples of cod meat of different degrees of spoilage. Volatile esters were not found in fresh or spoiled cod, whereas neutral carbonyls and keto acids were present in both the fresh and spoiled samples. Paper chromatographic analysis of the keto acids indicated that pyruvic and alpha-ketogluteric acids were present in approximately equal concentrations in the fresh and spoiled samples. Quantitative colorimetric tests have shown that benzene-soluble carbonyls (mainly neutral carbonyls) increase in cod during spoilage. Preliminary results indicate that a sharp increase in carbonyl content occurs in cod at about the time that the fish would be judged organoleptically unacceptable. Additional work on the neutral carbonyls is being planned for the future. Consideration will be given to the carbonyl content of spoiling fish as it affects mechanism of spoilage and its potential usefulness as a condemnation test.

Note: Also see Commercial Fisheries Review, August 1959, p. 17.

THREAD HERRING MEAL NUTRITIONAL STUDIES

Studies on the nutrional value of the Gulf of Mexico thread herring meal have been started by the U.S. Bureau of Commercial Fisheries technological laboratory at College Park, Md.

The studies involve (1) nutritional tests with rats within the laboratory, (2) metabolizable energy, and (3) digestibility of the meals. Metabolizable energy and digestibility studies are to be carried out under contract by Lime Crest Laboratory in New Jersey.

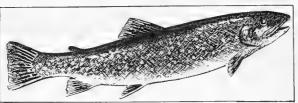
The Gulf thread herring, since it is available in large schools and possesses a high fat content during the winter, promises to develop into a winter industry to supplement the summer menhaden industry in the Gulf. A total of 55 vessels are reported agreed to fish for thread herring. There are two species available; one with a fat content of 21 percent is suitable and the other, with a fat content of 3 percent, has no practical use now.

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SPLAKE--HYBRID PRODUCED BY CROSSING LAKE TROUT AND BROOK TROUT

New or exotic fish species have a certain appeal. One of these is the splake, a hybrid, which is produced by crossing a lake trout with a brook trout.

Although sometimes reported as a new species, the splake was described at a meeting of the American Fish Cultural Association in 1880. The report at this meeting stated that an R. B. Roosevelt gave a paper on hybrids in which he described the cross of lake trout female by brook



Splake (hybrid trout)

trout male and indicated that hybrids of this type were being held in a hatching house in New York State. Wisconsin also crossed female lake trout and male brook trout in 1884.

Records are incomplete, but apparently little was done with this species for a number of years. Interest in the splake was revived in the last decade.

In 1957 Wisconsin obtained some splake fingerlings from Marquette, Mich., through the courtesy of the Michigan Conservation Department. During 1958, 4,000 of these splake were stocked in Little Bass Lake, Oneida County. A 17-inch size limit was imposed on this species and it will take several years for them to reach legal size.

The Crystal Springs trout hatchery recently completed stocking 1,000 6-inch splake from the same source in Crystal Lake, Vilas County. These hybrids were produced by fertilizing lake trout eggs with brook trout sperm. This hatchery also has on hand 3,800 lake trout female-brook trout male hybrid fingerlings and 7,300 fingerling hybrids obtained by crossing brook trout female-lake trout males.

The lake trout eggs fertilized by brook trout sperm apparently produce the hardiest splake. Progeny resulting from a reversed cross are frequently weak and crippled, since the brook trout egg is too small for a lake trout embryo. A great percentage of the weaknesses are evidenced in the form of deformed tails.

In appearance the splake resembles both parents. It retains the square tail of the brook trout, but the red speckles are not as prominent. Its body shape is slimmer than that of the brook trout. This is especially true of young splake.

The introduction of splake in Little Bass Lake has been too recent to determine its success. However, the State of New York has been managing several lakes for this species since 1954. Fingerlings from 3.5 to 5 inches were stocked in the fall. In one year, they had increased in length by $2\frac{1}{4}$ to 8 inches.

In the upper peninsula of Michigan splake were introduced in one lake three years ago which are now 17 inches in length.

The splake is an avid feeder and therefore makes rapid growth gains. Canada reports excellent growth of fingerling splake stocked in Agnes Lake in 1951. By 1953 some of the fish weighed almost 2 pounds.

Canadian fish culturists report that these hybrids are fertile and have successfully spawned in lakes in which they have been introduced. The Michigan Department of Conservation has successfully fertilized splake eggs with sperm from splake males.

This fish has the reputation of being a good fighter and a tasty fish as well. Habitat requirements of this hybrid are intermediate between the lake trout and the brook trout. Reports indicate that this fish utilizes the upper regions of a lake more frequently than does the lake trout. These attributes make him very popular with anglers. If the splake introduction in Wisconsin lakes is successful, some excellent fishing is in store for our fishermen.



American Samoa

TUNA LANDINGS BY JAPANESE VESSELS, 1957-58:

In 1957 a total of 56 Japanese vessels landed 255 trips in American Samoa with 8,667 metric tons of tuna, of which 5,535 tons was albacore, 1,523 tons was yellowfin, and 500 tons was big-eyed tuna, according to the "Annual Report of Catch Statistics for 1957," published by the Japanese Ministry of Agriculture and Forestry.

According to a report, "The Present Condition of the Japanese Fishing Industry," published in July 1958 by the Japanese Fisheries Agency, the number of Japanese tuna vessels operating out of American Samoa in 1958 was 42, and the deliveries were being held within the range of approximately 10,000 metric tons a year.

According to preliminary figures supplied by the Japanese Fisheries Agency, landings by Japanese vessels at Samoa in 1958 totaled 10,567 metric tons made up of 8,169 tons of albacore, 1,963 tons of yellowfin, and 432 tons of big-eyed tuna.

The 1959 edition of "Present Conditions and Prospects in the Export of Agriculture, Forestry, and Fishery Products," published by the Japan Export Trade Promotion Agency (JETRO), reports sales in 1958 to the cannery in Samoa of 12,688 short tons of fish, including 8,964 tons of albacore, 2,150 tons of yellowfin, and 476 tons of big-eyed tuna. The report states that these figures represent landings from 268 trips, and it further states that hitherto the quota for deliveries to Samoa had been 10,000 tons annually but that this had been increased in 1958 to 12,000 tons. According to this report, the long-liners based at Samoa are of 50 to 150 tons gross.

Figures informally supplied by the Ministry of International Trade and In-

dustry show that from October 1957 to June 1959 landings at Samoa totaled 15,859 short tons, valued at US\$2,756,614, for a monthly average of 752 short tons.

As for how the limitation of 12,000 tons of tuna to American Samoa and other similar tuna export limitations are imposed and enforced, the situation seems to be as follows: The Ministry of International Trade and Industry has legal authority under the Foreign Exchange and Foreign Trade Control Act of December 1949 to regulate the export of certain commodities by the issuance of export licenses. In the case of tuna, which is one of the commodities covered, the Ministry must consult with the Ministry of Agriculture and Forestry concerning the regulation of exports. The Ministry of Agriculture and Forestry consults with the producers' organization, the Export Frozen Tuna Producers Association, and the exporters' organization (the Japan Frozen Foods Export Association), which exist under the authority of the Fishery Exports Promotion Act of 1954, as revised in 1957, and which are placed by that law under the supervision of the Ministry of Agriculture and Forestry. In the case of an export arrangement which involves the basing of tuna fishing boats in a foreign country, as in Samoa, the Ministry of Agriculture also consults with the Japan Federation of Tuna Fisherv Associations.

TUNA LANDINGS, JANUARY-AUGUST 1959:

American Samoa Tuna Landings, January-August 1959							
Species		1959	JanAug.				
Species	June	July	August	1959	1958		
(1,000 Lbs.)							
Albacore	1,533	2,208	1,921		13,734		
Yellowfin	459	388	206	3, 108	3,872		
Big-eyed	119	68	12	681	845		
Skipjack	-	-	4	4	-		
Total	2, 111	2,664	2,143	17,000	18,451		
Note: Most of these tuna were landed by Japanese vessels; a							
small amount by South Korean vessels.							

California

ALBACORE TUNA MIGRATION OFF PACIFIC COAST STUDIED:

M/V "N. B. Scofield Cruise 59-S-4-Albacore: The offshore area of California and northern Baja California from approximately 265 miles west of Point Montara (San Francisco) to 530 miles west of Todos Santos Island (Ensenada, Baja California) was surveyed by the California Department of Fish and Game research vessel N. B. Scofield from June 1-25, 1959. This cruise was made

scouted during daylight hours, by using surface trolling gear.

The first albacore schools of the 1959 season were located June 5 in an area between 90 and 120 miles W. by N. of Point Arguello. By the end of the survey, 312 albacore were caught in an arealying between latitudes 32°20' N. to 37°30' N. and longitudes 121°22' W. to 128°23' W.

Best fishing, as evidenced by an average catch of $3\frac{1}{2}$ to $5\frac{1}{2}$ fish per trolling hour, was found from latitude 33° to 34°

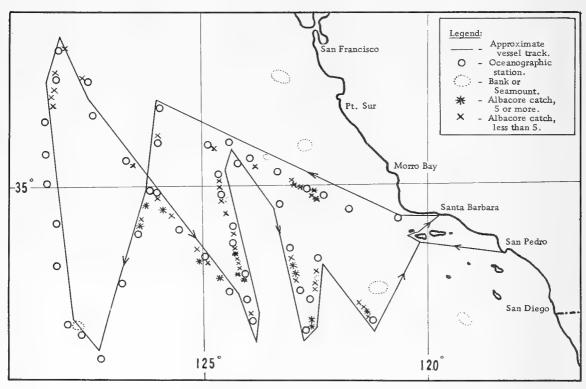


Fig. 1 - M/V N. B. Scofield Cruise 59-S-4-Albacore (June 1-25, 1959).

in cooperation with that scheduled for the M/V Hugh M. Smith by the Hawaii Biological Laboratory, U. S. Fish and Wildlife Service, to explore this offshore area prior to the commercial albacore season in an attempt to determine the occurrence and migration route of albacore schools approaching the Pacific Coast; to tag and release albacore; and to gather biological and oceanographic data that might be related to the occurrence of albacore.

Approximately 1,600 nautical miles of the 2,000-mile survey track were

N., between longitude 124° and 125° W. Ninety-eight percent of the albacore caught ranged from 11 to 14 pounds. The remaining two percent was evenly divided between the nine and 20-pound groups. Food organisms recovered from stomachs of untagged fish and from regurgitated matter consisted primarily of Pacific sauries, squid, larval northern anchovies, Pacific jack mackerel, pelagic barnacles, and euphasiids.

Gill net (consisting of 10 shackles $4\frac{1}{2}$ to $7\frac{1}{2}$ inch mesh) was set 390 miles W. by N. of Point Arguello. The gearfished

overnight and no catch resulted. Other sets were omitted because of weather conditions.

Albacore were tagged to determine movements and growth rates, and to compare recovery rates of "spaghetti" tags with those of more rapidly applied dart tags. The number of albacore tagged at any given location varied from 1 to 22.

Dart and "spaghetti" tags were used alternately. Trouble with breakage of the dart heads interrupted the sequence occasionally and only 95 fish with dart tags compared to 110 with "spaghetti" tags were released.

Sea surface temperatures ranged from a low of 12.2° C. (54° F.) near Point Conception and the northern Channel Islands to a high of 17.8° C. (64° F.) in the extreme southwesterly area of the survey. All albacore were caught in water ranging from 14.8° C. (58.6° F.) to 16.3° C. (61.3° F.)

Bathythermograph casts were made 2 to 3 times each day at distances apart averaging 45 miles (range: 20 miles to 90 miles).

Surface water samples for inorganic phosphate analysis and salinity determination were collected at each bathythermograph station. Surface water samples for Carbon 14 analysis were collected and field processed at 16 stations.

A 20-minute surface plankton tow with a one-meter net was made at five evening stations.

One night light station was occupied while drifting with the gill net. An estimated 10 to 30 Pacific sauries were the only organisms noted under the 1,500watt light. Weather and sea conditions made it necessary for the vessel to maintain headway at night rather than drift which is essential for operating night light stations successfully.

Daytime observations were interesting because of the lack of marine life in areas where albacore were caught. The largest concentration of birds consisting waters was noted in areas of cold dirty water within 30 miles of Point Concep-

Note: Also see Commercial Fisheries Review, Sept. 1959 p. 21.

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PELAGIC FISH POPULATION SURVEY OFF COAST OF SOUTHERN CALIFORNIA CONTINUED:

Airplane Spotting Flight 59-13-Pelagic Fish: The inshore area from the Mexican border to Pigeon Point was surveyed from the air (June 29, July 1-2, 1959), by the California Department of Fish and Game Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

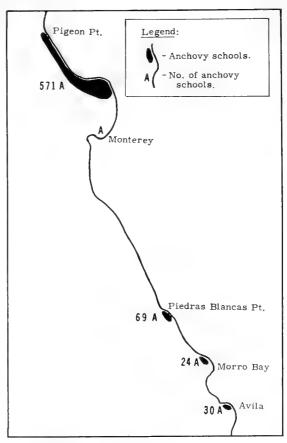


Fig. 1 - Airplane Spotting Flight 59-13 (June 29, July 1 and 2, 1959).

Possibly as a result of storm conditions during the week preceding the survey, very few fish schools were seen between Los Angeles Harbor and the Mexiof gulls, terns, storm petrels, and shear - can border. Although weather conditions were perfect and the water clear, only 9 anchovy schools and 1 of white sea bass were seen: 6 of the anchovy schools were close to shore near Scripps pier at La Jolla, 2 just off the mouth of the Tijuana River, and 1 three miles off San Onofre. A large white sea bass school was seen three miles off the town of Carlsbad.

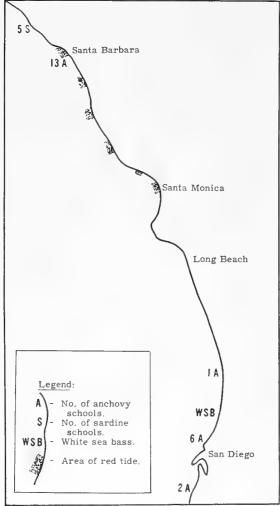


Fig. 2 - Airplane Spotting Flight 59-13 (June 29, July 1 and 2, 1959).

North of Los Angeles Harbor, 707 anchovy and 5 sardine schools were tallied. The majority of the anchovy schools (571) were observed at the north end of Monterey Bay in a gradually diminishing band reaching to Ano Nuevo Point. These schools varied widely in size but were visible as dark, tight balls when in deep water and loose stringy concentra-

tions when close to shore. It was not possible to scout the southern two-thirds of Monterey Bay because of a thick, low, cloud cover. The five sardine schools were seen east of Point Conception 2 to 3 miles off El Capitan. The remainder of the anchovies were found in four small groups in the following locations: outside the kelp between Santa Barbara and Montecito (13 schools); San Luis Obispo Bay (30 schools); north end of Estero Bay (24 schools); and San Simeon Bay (69 schools).

Water conditions south of Point Vicente and north of Santa Barbara were good with clear clean water. From Point Vicente to Santa Barbara the inshore water was very dirty and heavy dinoflagellate blooms occurred between Ballona Creek and Santa Monica east of Malibu pier, at the northeast end of Zuma Beach, between Port Hueneme and Ventura, near Ricon Point and between Summerland and Santa Barbara,

Many concentrations of jellyfish (probably Vellela) were seen in Monterey Bay. They showed up as greenish-white streaks when viewed from 1,500 feet but took on a lavender cast when observed from a low level.

Note: Also see Commercial Fisheries Review, September 1959 p. 22.



Canned Fish

CONSUMER PURCHASES, OCTOBER 1958-MARCH 1959:

Approximately 108.8 cases of canned tuna were purchased per 1,000 families in the United States during October 1958-March 1959. Imported tuna represented about six percent of those purchases. By types of pack, purchases of domestic chunk tuna at 67 cases far exceeded purchases of solid-pack at 23.2 cases and grated at 12.5 cases per 1,000 house-holds.

Total purchases of both domestic pack and imported canned tuna were highest in those families whose head of the household had a college education. However, families whose head had only high school training purchased more solid pack and grated tuna. Families with teenagers purchased more solid-pack tuna and more grated tuna than those households with no children or with children of younger age groups. Those families with children aged 6-12 bought more chunk-style and the imported product than did families in the other categories.

Families in which the wives were not employed purchased about 11 percent more canned tuna than those in which the wives were working. Those households with nonworking wives bought 21 percent more chunk-style, 27 percent more imported, and about the same amount of grated tuna as the households in which the wives were employed.

During October 1958-March 1959, 33.5 cases of canned salmon were purchased per 1,000 families in the United States. Pink salmon made up about 53 percent of those purchases, while red salmon purchases amounted to 21 percent of the total.

Total purchases of canned salmon were highest in those families in which the head of the household had only a grade school education. However, families with a college-educated person as head of the household bought more chinook, red, and medium red salmon than did families whose heads had grade school and high school education only.

Purchases of red salmon by families without children were larger than those purchases by households with children. However, families with children of preschool age led other groups in purchases of chum salmon. Households with teenagers bought about 111 percent more pink salmon than families without children, and 14 percent more than those with children 6-12 years old.

Households in which the housewife was not employed purchased 34.8 cases of salmon which was about 16 percent greater than the purchases made by those families in which the housewife was employed.

A recent publication of the U. S. Bureau of Commercial Fisheries contains information on consumer purchases of

canned fish by family characteristics for six months beginning with October 1958. The data (provided by the Market Research Corporation of America under a contract financed by the Bureau) represents estimates of national purchases by household consumers only. The report summarizes the data on purchases of canned tuna, canned salmon, and canned sardines. The purpose of this report is to provide additional information concerning buying practices of households as related to regions, city-size locations and other socio-economic factors.

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CONSUMER PURCHASES, JULY 1959:

Canned tuna purchases by household consumers in July 1959 were 998,000 cases of which 64,000 cases were imported. By type of pack, domestic-packed tuna purchases were 217,000 cases solid, 616,000 cases chunk, and 101,000 cases grated or flakes. The average purchase was 1.9 cans at a time. About 32.0 percent of the households bought all types of canned tuna; only 2.2 percent bought the imported product. The average retail price paid for a 7-oz, can of domestic solid or fancy was 34.9 cents and for a $6\frac{1}{2}$ -oz, can of chunk 27.6 cents. Imported solid or fancy was bought at 28.6 cents a can. July purchases were higher than the 964,000 cases bought in June by 3.5 percent; retail prices in most cases were slightly lower.

During July, household consumer purchase of California sardines were 36,000 cases; and 31,000 cases imported sardines. The average purchases was 1.5 cans at a time for California sardines and 1.9 cans for imported. Only 1.7 percent of the households bought canned California sardines and 1.8 percent imported. The average retail price paid for a 1-lb. can of California sardines was 23.9 cents, and for a 4-oz, can of imported 26.6cents. Retail prices were higher for both California and imported canned sardines. July purchases of California sardines were lower than the 41,000 cases bought in June by 12.2 percent.

Canned salmon purchases in July 1959 were 216,000 standard cases, of which 112,000 cases were pinks and 53,000 cases

reds. The average purchase was 1.2 cans at a time. About 14.8 percent of the households bought all types of canned salmon; 7.3 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 57.2 cents and for red 88.0 cents. July purchases were down about 4.0 percent from the 225,000 cases bought in June.



Canned Foods

OUT-OF-STOCK CONDITION COSTLY TO STORES:

A typical supermarket loses about \$3,000 a year in canned food sales when out of stock. This was the conclusion in reporting the highlights of the Out-of-Stock Study to the trade press in an August 21 release by the National Canners Association public relations counsel. The study was based on findings of a 12-week period (June through August 1957) in 12 supermarkets in the Philadelphia-New Jersey area.

The report makes the following summary of findings with reference to fishery products:

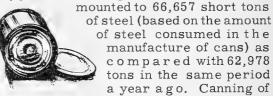
The most serious out-of-stock conditions were found in the canned fish and canned meat and poultry groups. On the average more than 5 percent or 5 of the 98 items in these groups were out-of-stock each day in each supermarket.

For canned foods as a whole, Friday was the day of the week with the lowest percentage (2.4 percent) of items out-of-stock, followed by Thursday with 3.0 percent. Monday, Tuesday, Wednesday, and Saturday all showed an average of 3.3 percent out-of-stock. (Information Letter, August 29, 1959, National Canners' Association).



Cans--Shipments for Fishery Products, January-July 1959

Total shipments of metal cans for fishery products during January-July 1959 a-



fishery products in July this year included tuna, Maine sardines, salmon, shrimp, and squid. Shipments of metal cans were up by 19.4 percent from June to July this year, but lower by 8.5 percent for this year as compared with July a year ago. Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the



factor: 23.0 base boxes of steel equal one short ton of steel.

Central Pacific Fisheries Investigations $\frac{1}{2}$

SKIPJACK TUNA BEHAVIOR STUDIED IN VICINITY OF HAWAIIAN ISLANDS:

M/V "Charles H. Gilbert" Cruise 45: The chief objective of the 60-day cruise around the main Hawaiian Islands and French Frigate Shoal by the U.S. Bureau of Commercial Fisheries Research vessel Charles H. Gilbert was to study the behavior of tuna, with the long-term goal of using the knowledge obtained to aid the Hawaiian commercial tuna fishermen. About all of the July-August 1959 research was devoted to skipjack or aku. The reactions of skipjack were noted when various kinds of bait were used, when baits were pepped up" with enhancers such as glittering tinsel and water sprays, when the amount of bait was varied, and when colored dyes and various sounds were introduced into the water. Although the results of these experiments will only be known in detail after weeks of analysis, it is hoped that we will ultimately discover what it is that makes a good bait, and also how this bait should be used. The cruise was completed on September 3, 1959.

1/These investigations prior to the August 1959 Commercial Fisheries Review were listed under Pacific Oceanic Fisheries Investigations.

A new blister-type underwater observation chamber on the vessel was used. From this vantage point 7 feet beneath the surface, observers watched tuna activity during fishing. They recorded fish behavior on movie film and personal impressions on voice records. The blister was an outstanding success, for not only was it free from annoying bubbles, which limited the use of previous chambers, but its spaciousness enabled biologists to observe tuna behavior for several hours in reasonable comfort.

The new blister is superior to underwater television as a device for studying tuna behavior. Although the television camera occasionally "saw" farther through the water than the human eye or a movie camera, its adjustment and operation were too delicate for the rugged conditions normally prevailing during tuna fishing.

Because certain experiments could not be conducted on the high seas, 73 skipjack were placed in the vessel's livewells, and 37 of these were later transferred to a salt-water swimming pool at the Bureau's Kewalo laboratory. Because skipjack tuna are very excitable tranquilizing drugs were used experimentally to quiet the fish. The drugs also helped to quiet some specimens of the more docilelittle tuna (kawakawa), in the pond when the skipjack were introduced.

A seal and turtle census was conducted at French Frigate Shoal which is about 500 miles northwest of Honolulu.

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NEW LIVE-BAIT RESOURCES FOR HAWAIIAN SKIPJACK TUNA FLEET STUDIED:

One of the factors limiting the total landings of skipjack in Hawaii is the availability of live bait. Nehu, a local species of anchovy, is the principal bait and is frequently in short supply. Also, nehu are difficult to keep alive in the bait wells, thus further limiting the available supply and limiting the distance and time of operation of the sampans.

The Honolulu Biological laboratory of the U. S. Bureau of Commercial Fisheries is presently engaged in studies directed towards both supplementing the live-bait supply available to the Hawaiian skipjack fleet and developing a more hardy bait. Three species are presently under investigation, tilapia (Tilapia mossambica), Marquesan sardine (Harengula vittata), and threadfin shad (Dorosoma petenensis).

The tilapia studies are approaching completion. The results of these studies indicate that these fish can be economically reared in ponds; that they may be readily acclimatized from fresh to sea water; that early spawning may be induced, thus making adequate supplies of the bait available to the fisherman at the onset of the skipjack season; that they are a hardy fish and can be carried in the bait wells for several days or weeks through oceanic areas with changes of temperature of at least 10° F., and that, when properly used, they are a good bait for large skipjack. The results of these tilapia investigations were one factor in the State Legislature appropriating \$130,000 for the construction and \$50,000 for maintenance of a tilapia rearing facility by the State Department of Fish and Game.

During a survey of the fishery potentials of the waters of French Oceania, the Marquesan sardine was used exclusively as bait during live-bait fishing for skipjack and yellowfin. Because of its proven qualities, a program of introduction of this fish into Hawaiian waters was started in 1956. All introductions were made in waters near the Island of Oahu. By 1959, as indicated by recoveries made by commercial fishermen during baiting operations, these fish had moved to waters near at least seven of the eight major islands. For use by the fishermen, jars with formalin and labels have been left at strategic points on the Islands.

A particularly interesting collection was made in Kaneohe Bay in early August. One of the sardines in this collection was the largest (about 6 inches) seen by the biologists--larger than any reported from the waters of either French

Oceania or Hawaii. In addition, further evidence of successful spawning was given by the presence of $2\frac{1}{2}$ -inch sardines in this collection.

During 1959, a small shipment of threadfin shad was introduced into reservoirs. This potential live bait, native to Tennessee and now well established in the lower Colorado River watershed. spawns in fresh water but is readily acclimatized to sea water.

On August 27, 1959, a shipment of approximately 3,500 threadfin shad was received in Honolulu. These fish were collected in southern California and transported to Hawaii. Shipped in sea water, the fish were acclimatized to pure fresh water upon arrival and then planted in various reservoirs on the Islands of Oahu, Kauai, and Maui and in tanks at the laboratory. The latter fish are to be used as a stockpile in case of failure of some of the other plants. Although apparently not as hardy as either the tilapia or Marquesan sardines, only a few shad were lost during transport and handling of the August shipment.

Although nehu will undoubtedly be the primary live bait used by the Hawaiian skipjack fleet for some time to come, it is anticipated that one or more of these new potential baits will be used to supplement the inadequate supply of nehu-particularly during those periods when "season" fish are available to the fleet and, either because of exploitation or lack of availability due to natural causes, the nehu are in short supply.



Clams

SOFT-SHELL CLAMS FOUND IN
MARYLAND CHESAPEAKE BAY WATERS:
There is a large crop of soft-shell clams in Anne Arundel and Queen Anne's County Chesapeake Bay waters, according to a shellfish biologist at the Maryland Chesapeake Biological Laboratory. Most of the quarter-million bushels of clams were found along the inshore, sandy edges of once

productive oyster bars, where oysters no longer are able to survive in commercial quantities.

The first phase of the biologist's findings was followed with a precedent-breaking step by the Maryland Tidewater Fisheries Commission, which maintains tight control over the State's oyster bars. The charted bars in the past have always been off-limits for any other use, regardless of whether or not oysters were present. The Commission

broke the precedent after the fact-finding survey and opened parts of the grounds to fishing. The Commission received considerable encouragement for its action from the clam fishermen who themselves are largely former oystermen.

The biologist began the survey two years ago at the request of Anne Arundel watermen, hoping to work in the in-shore side of the Three Sisters oyster bar. Using a mechanical clam digger, he quantitatively checked a 350-acre area and found a crop of 252 bushels to the acre. "Incidentally, we didn't see a single live oyster there," the biologist de clared. Many years ago, the bar was one of the Chesapeake's best sources of oysters. In 1958, 300 more acres were surveyed on Three Sisters, plus 235 acres off Kent Island on Broad Creek Bar's inner edge.

Meanwhile, at the request of Somerset County watermen. Tangier and Pocomoke Sound bottoms were checked and plenty of clam shells were found, but no clam population worth harvesting. The hurricanes in 1954 and 1955 may have stirred up the bottom too much and killed off most of them,

It was while checking the clam population in the Sounds that the biologist reported enormous concentrations of buried oyster shells in the area. The Tidewater Fisheries Commission Chairman later announced an ambitious program aimed at rehabilitating the oyster industry by using these and other oyster-shell deposits.

In June of this year the Chesapeake Biological Laboratory sent two biologists to the Three Sisters area again. checked 225 more acres to discover a population of 295 bushels to the acre.



Croakers

BIOLOGIST REPORTS ON DISAPPEARANCE OF YOUNG IN CHESAPEAKE BAY:

The disappearance of young croakers in the Chesapeake Bay was discussed by a biologist of the Virginia Fisheries Laboratory, Gloucester Point, Va., at the annual meeting of the American Fisheries



Society held at Clearwater, Fla., September 17-18. The study of the movement of young croakers within the Bay was begun by the Laboratory in 1950. In recent years the Virginia biologists have continued tracing the movements of these young fish and report that heavy kills occurred during the winter of 1957 and 1958 probably due to protracted cold weather.

Great numbers of young croakers appeared in the Bay and its rivers during the fall of 1957, which portended excellent fishing two years later. However, the situation changed during the winter months. "Although there were considerable numbers of young croakers present during the fall of 1957, they disappeared in mid-winter. Their disappearance coincided with a period when water temperatures were extremely low for a long period of time. Probably the extreme low temperatures destroyed the young croakers," the biologist stated.

Although croakers of large size have been caught this past summer and large numbers were caught in the commercial traps on Virginia's eastern shore during September, the chances of catching croakers of any size in 1960 will be extremely poor. "Not until there has been a successful development of young croakers through the winter will the depleted stocks be replenished," the biologist declared.

According to scientists croakers spawn in the fall and throughout early winter. The eggs hatch out in ocean waters just beyond the mouth of the Cheseapeake Bay and the young migrate into the Bay and up the rivers. There they remain throughout the remainder of the winter, spring, and summer, and return to the ocean in the fall when they are about a year old. Adults migrate into the Bay in spring and return to the ocean in the fall.

Cooperative surveys from the research vessel Pathfinder with scientists from the Chesapeake Biological Laboratory of Maryland have indicated that the scarcity of young croakers occurred not only in Virginia but also in Maryland during the winter and spring of 1958. The absence of year-old croakers in pound nets in the fall of 1958 also confirmed that the spawning for the previous fall and winter was extremely poor.

A similar kill occurred during the winter of 1958 and 1959 and experience indicates that no recovery of the croaker fishery can be anticipated for at least two years.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE
PURCHASES JANUARY-AUGUST 19

PURCHASES, JANUARY-AUGUST 1959:

Fresh and Frozen Fishery Products:
For the use of the Armed Forces under the Department of Defense, 2.1 million pounds (value \$859,000) of fresh and frozen fishery products were purchased in August 1959 by the Military Subsistence Agency field headquarters. The quantity purchased in August was down 7.0 percent from the preceding month, but was 30.6 percent above the amount purchased in August 1958. The value of the purchases in August 1959 was lower by 28.6 percent as compared with July and down 7.1 percent from August 1958.

Table 1 - Fresh and Frozen Fishery Products Purch Military Subsistence Supply Agency, August 1959 with Comparisons								sed by	
1	QUANTITY				VALUE				
1	August		JanAug.		August		JanAug.		
	1959	1958	1959	1958	1959	1958	1959	1958	
	(1,000 Lbs.)			(\$1,000)					
	2,112	1,617	15,730	16,196	859	925	8,049	9,334	

For the first eight months of 1959 purchases totaled 15.7 million pounds, valued at \$8.0 million--a decrease of 2.9 percent in quantity and 13.8 percent in value as compared with the same period of 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in August 1959 averaged 40.7 cents a pound, 12.2 cents less than the 52.9 cents paid in July and 16.5 cents less than the 57.2 cents paid during August 1958. This indicates that prices were lower and lower-priced products were purchased this August.

Canned Fishery Products: Sardines and tuna were the principal canned fishery products purchased for the use of the Armed Forces during August 1959. During January-August 1959 purchases of

Table 2 - Canned Fishery Products Purchased by Military
Subsistence Supply Agency,
August 1959 with Comparisons

QUANTITY

VALUE

Products Purchased by Military
Subsistence Supply Agency,
August 1959 with Comparisons

Į		QUANTITY				VALUE				
I	Product	August		JanAug.		August		JanAug.		
I		1959	1958	1959	1958	1959	1958	1959	1958	
ł			(1,000 Lbs.)				(\$1,000)			
ŀ	Tuna	150	908	2, 132	3,470	59	1/	997	1/	
I	Salmon .	2	1	15	1,401	2	1/	11	1/	
į	Sardines.	194	41	970	93	27	1/	143	1/	
1/ Unavailable.										

the three principal canned fishery products were lower by 37.2 percent from the purchases made in January-August 1958. Purchases of canned tuna were down by 38.6 percent and about 99.0 percent for salmon, but canned sardine purchases increased almost 10 times over the purchases during the first eight months of 1958.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher because it is not possible to obtain local purchases.

Fish Ladders

EFFECTIVENESS OF DIFFERENT TYPES OF SALMON FISHWAYS STUDIED:

Recent studies were conducted on the passage of blueback or sockeye salmon at the U.S. Bureau of Commercial Fisheries experimental research facility at Bonneville Dam. During the course of these studies 26 fish were individually timed in each of two types of endless fishways. The fishways were of the conventional ladder type, one fishway having 8-foot pools with 1-foot rise between pools; the other had 16-foot pools with 1-foot rise between pools. The mean time required for blueback salmon to ascend 104 pools of the 1-on-8 fishway was 2 hours and 57 minutes; for the 1-on-16 fishway 2 hours and 21 minutes. Tests were conducted previously on passage time for chinook salmon.

Results to date indicate the much cheaper to construct 1-on-8 fishway is about as effective as the 1-on-16 fishway for passing salmon over dams.

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BUREAU OF COMMERCIAL FISHERIES ACTIVITIES REVIEWED:

Research and management biologists of the U. S. Bureau of Commercial Fisheries and the States of Washington, Oregon, and Idaho, have done a great deal toward devising and testing methods for passing fish over dams. The scientists have found that the problem of getting adult salmon over dams can be met in a number of ways. Salmon migrating upstream are attracted to those areas

from which water is flowing. For example, at Bonneville Dam there are ten draft tubes from each of which some 12,500 second feet of water is issuing. In addition, there is a spillway with 16 normally-functioning gates each 50 feet wide and, of course, there are the fishway entrances with their relatively small flow of water. The task was to place the fishway entrances in such locations and to provide sufficient flows so that, with a minimum number of unsuccessful attempts, the salmon would find an entrance and proceed on upstream. Biologists have been successful in accomplishing this task.



Fish ladder at Bonneville Dam, Columbia River.

There are, of course, other means of providing upstream fish passage at dams, such as fish locks, trams, or by trapping and hauling. Whenever possible, biologists prefer to have the fish ascend a fish ladder. However, in the case of some high dams, the only practical procedure is to trap and haul the fish over in tank trucks.

Many improvements have been made in fish ladder design, and experiments are being conducted at the research facility at Bonneville to determine the optimum pool length and width which will pass salmon most effectively. Recently it has been found that both the length and width of the steps in fish ladders may be reduced. This will result in a substantial saving of money in the design of future fishways.

The problem of providing safe passage over dams for young salmon en route to sea is much more difficult. However, various schemes have been worked out and are being tested at the present time. In particular, fingerling "skimmer" facilities and a fingerling "ski jump" have been installed above Pelton Dam on the Deschutes River in Oregon. These methods are passing young fish and experiments are under way to measure their effectiveness. Another new approach is being investigated by scientists at the Bureau's Seattle laboratory. This entails guiding fingerlings into traps or bypasses by an array of energized electrodes placed in the forebay of dams. Guiding fish by electricity is being evaluated at Lake Tapps, Wash.



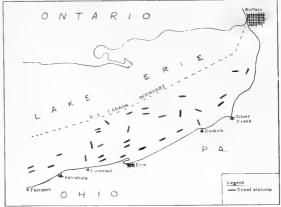
Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY FISHING IN LAKE ERIE CONTINUED:

M/V"Active" Cruise 4: To study the commercial availability of smelt and other fish stocks in Lake Erie, the U.S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Active conducted surface scouting and echosounding operations on Cruise 4 (August 3-17, 1959). The vessel operated between Conneaut, Ohio, and Buffalo, N. Y.

During the cruise, 35 exploratory drags were made in the 5- to 25-fathom depth range using a 50-foot two-seam balloon trawl with a $1\frac{1}{2}$ -inch mesh cod end. Catches of smelt in eastern Lake Erie ranged from trace amounts to 150 pounds per tow. The majority of smelt in this area were 30 to 35 to the pound. Some large smelt, 12 to 18 to the pound, were also taken. Small amounts of spot-tail shiners, emerald shiners, white bass, white suckers, sheepshead, and yellow perch were taken in the shallow-water drags. Several tows at "standard stations" in the area visited during Cruise 3 produced catches up to 500 pounds of smelt, 12 to 18 to the pound. One commercial fisherman took trawl catches up to 1,500 pounds of smelt per day from this area.

Numerous large surface schools of small emerald shiners were observed. No seine sets were attempted.



M/V Active Cruise 4, (August 3-17, 1959).

Surface temperatures recorded during the cruise showed little variation-from 74° F. to 75° F. Bottom temperatures ranged from 41° F. at 25 fathoms to 74° F. at 5 fathoms. Thermal stratification was well defined throughout the Eastern basin.



Great Lakes Fishery Investigations

WESTERN LAKE ERIE BIOLOGICAL RESEARCH CONTINUED:

M/V"George L. "Cruise 6, August 1959: Young yellow pike (walleye) 7-9 inches long were taken by gill net or trawl at all 7 stations in the western basin of Lake Erie by the U. S. Bureau of Commercial Fisheries research vessel George L. during the regular summer cruise. Young yellow perch were taken in large numbers-often more than 500 per 10-minute haul--in all areas and were the most abundant fish in the trawl catches. Young white bass and spot-tail shiners were caught in larger numbers and were more widely distributed than young sheepshead, emerald shiners, troutperch, alewife, and gizzard shad.

Few adult commercial fish were taken by trawl. Yellow perch catches were lower than previously in the year. Catches of sheepshead and channel catfish were light.

The catch of fish in overnight sets of "canned" gill nets little resembled trawl catches in the same area at the same time. Large numbers of yearling gizzard shad were taken at most stations by gill net-few were taken by trawl. Several dozen adult yellow pike were caught by gill net at one station 10 miles north of Monroe. Only one other large yellow pike was seen during the entire cruise. The catch of adult perch in gill nets was light.

Surface water temperatures ranged from 79° to 81° F. and only a few degrees separated surface and bottom temperatures. Oxygen content appeared normal at all depths.

Water transparencies, measured by Secchi disc, were less than earlier in the summer. Algal blooms were apparent in all areas. Bottom samples consisted mostly of midge larvae. Mayfly nymphs were taken rarely.

Examination of the stomach contents of the larger fish indicated that yellow perch, sheepshead, and other bottom feeders were consuming little food. Predator fish were feeding normally and consuming large quantities of fish.

The gill-net gang used during the cruise was approximately 1,700 feet long and consisted of mesh sizes ranging from $1\frac{1}{4}$ to 5 inches.

Note: Also see Commercial Fisheries Review, October 1959, p. 29.

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WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 4, July 27-August 4, 1959: Midsummer environmental conditions were studied at three index stations located (1) southeast of Stockton Island, (2) northeast of Bear Island, and (3) east of Pike's Bay. In addition to the fishery and environmental studies at the index stations, trawl and gill-net operations were conducted north of Little Girl's Point and extensive explorations were made by trawling from a small boat and with a 25-foot, ½-inch-mesh seine along the shores of Stockton Island.

Standard gill-net gangs (1-inch to 5-inch mesh by $\frac{1}{2}$ -inch intervals) were fished. Trawl tows were made at each station with a 30-foot, semi-balloon trawl. Water samples for chemical analyses, and plankton and bottom samples were collected. Water temperatures at each index station and Secchidisc readings and observations of currents were recorded.

Gill nets set southeast of Stockton Island in 21 to 25 fathoms took 7 lake trout, 40 whitefish, 6 menominee whitefish, 66 lake herring, 19 \underline{L} . hoyi, 8 \underline{L} . zenithicus, and 2 \underline{L} . kiyi. The herring and \underline{L} . hoyi were extremely difficult to identify in this catch. The fact that the 2 species were observed spawning together in this location during the fall of 1958 suggests the possibility of hybridization. Further studies of this problem are scheduled.

Trawl tows southeast of Stockton Island took small numbers of lake trout, whitefish, lake herring, smelt, pygmy whitefish, ninespine stickleback, and slimy muddlers. At this station the surface temperature was 69.8° F.; bottom temperature was 40.6° F.

Gill nets set northeast of Bear Island in 45 fathoms took 157 L. hoyi, 10 L. kiyi, 4 L. zenithicus, and 3 lake herring. Small numbers of smelt and burbot also were captured.

Trawl tows northeast of Bear Island took 37 \underline{L} . hoyi and 4 \underline{L} . zenithicus. At this station the surface temperature was 63.5 $^{\circ}$ F.; bottom temperature was 39.6 $^{\circ}$ F.

Gill nets fished east of Pike's Bay in 19 fathoms took 8 lake trout, 8 lake herring, 57 smelt, 176 L. hoyi, 4 L. zenithicus, and 1 burbot.

Two trawl tows at this station took 18 lake trout, 73 L. hoyi, 138 smelt, 1 pygmy whitefish, 1 L. zenithicus, 41 slimy muddlers, and 6 ninespine sticklebacks. The lengths of the trout ranged from 5.1 to 12.1 inches; 10 of the trout were fin-clipped. At this station the surface temperature was 68.5° F; bottom temperature was 42.4° F.

A standard gang of gill nets set in 25 fathoms north of Little Girl's Point took mainly L. hoyi and L. zenithicus but included 2 lake trout and 8 lake herring. Four 10-minute trawl tows at 15, 18, 20, and 27 fathoms took predominately smelt and small, unidentified coregonids. Four small trout were taken at 18 and 20 fathoms. The surface temperature in this area was 70.8° F.

The outboard motor boat conducted trawling operations in shallow waters just off the shores of Stockton Island. Tows were made in midafternoon and again after dark to compare catches from dayand nighttime fishing.

The catch in tows made during the day was very light and consisted mainly of smelt, slimy muddlers, menominee whitefish, trout-perch, johnny darters, and ninespine sticklebacks. Largest numbers of fish were taken on the same grounds at about 11:00 p.m. The longnose dace and northern lake chub were captured in addition to the species taken during the day.

Night trawling by the Siscowet in this area was hampered by rough and dirty bottom. Two 10-minute hauls took 4 lake trout, 2 L. hoyi, 2 pygmy whitefish, 1 menominee whitefish, 170 slimy muddlers, and 50 ninespine sticklebacks.

A 25- by 6-foot, $\frac{1}{2}$ -inch-mesh seine was hauled along the shoreline of Stockton Island. The catch from one haul made in the afternoon consisted of 1 slimy muddler. A haul in the same area after dark took over 200 fish, mainly ninespine stickleback, muddlers, and northern lake chubs.

The surface temperature during these operations was 70.0° F.

Cruise 5, August 10-22, 1959: Studies were conducted at Isle Royale, Mich., Thunder Bay, Ont., and the Apostle Islands, Wis., during this cruise. The stations worked are located as follows:

Isle Royale: north of Thompson's Island; Grace Harbor; southeast of Menagerie Island; south of Mott Island; Rock Harbor; northeast of Amygdaloid Island; south of Rainbow Cove.

Thunder Bay: between Pie and Welcome Islands; north of Welcome Island.

Apostle Islands: south of Stockton Island.

The primary objectives of this cruise were to sample various populations of coregonids in the Isle Royale, Thunder Bay, and Apostle Island regions for purposes of identification and comparison, and to sample various populations of lake trout in the Isle Royale region to compare their relative

abundance with last year's catch and to tag and release live specimens to learn their movements within the lake.

With the exception of the station established in Rock Harbor, gill nets were fished at each location. Trawling was attempted only south of Mott Island and in Rock Harbor.

One 15-minute trawl tow south of Mott Island in 62 fathoms yielded 2 species of sculpins (deepwater sculpin and spoonhead muddler), 15 <u>L</u>. <u>zenithicus</u>, 1 <u>L</u>. <u>hoy</u>i, and 1 smelt.

A 14-minute tow in Rock Harbor took about 100 pygmy whitefish, 1 trout, 3 herring, 1 smelt, 1 burbot and 7 slimy muddlers.

Gill-net catches varied considerably with location and depth of set. The gangs were made up mostly with small mesh nets $(1\frac{1}{4}, 2, 2\frac{1}{4}, 2\frac{1}{2}, 3, 3\frac{1}{2}$ -inch mesh). One 6-inch mesh net was attached to the gang in search of large trout and whitefish.

Of the 362 trout captured by gill net in sets made in the Isle Royale area, 149 were tagged with "spaghetti" tags and were released. Approximately 100 chubs were preserved in formaldehyde for laboratory examination.

Five bull nets (gill nets 300 feet long and 20 feet deep) were fished in an oblique set in Grace Harbor (20 fathoms). This set took 162 herring which were distributed almost uniformly from the surface to the bottom. Several of the herring appeared to be nearly ripe. A few L. zenithicus were also taken in this set and several of them also appeared to be nearly ripe.

Three gangs of two nets each $(2\frac{1}{4}, 2\frac{1}{2}\text{-inch}\,\text{mesh})$ were set in Thunder Bay in search of Leucichthys reighardi dymondi, a subspecies reported to exist along the north shore of Lake Superior, but about which very little is known. The catch from these three gangs consisted mainly of longnose suckers, lake herring, and chubs which were not immediately identified. Many of the herring had the extremely deep bodies and short snouts attributed to Leucichthys artedi albus. This nominal subspecies is common to Lake Erie and has been previously reported in bays of Lake Superior. Many specimens of both lake herring and chubs were preserved.

A gang of 6 small-mesh nets were set at 50 fathoms south of Stockton Island. About 225 chubs were taken, most of them L. hoyi and L. zenithicus. Several of these specimens were frozen and later compared with like species from Isle Royale and from eastern Lake Superior.

The surface temperature at Isle Royale varied from 60.8° F. in Grace Harbor to 56.2° F. north of Thompson's Island. In Thunder Bay the surface temperature ranged from 58.4° to 60.5° F. South of Stockton Island the surface temperature was 64.9° F.

Officials of the U. S. Park Service, Isle Royale, Mich., requested that the Bureau biologists set gill nets in Siskiwit Lake in search of lake trout reportedly to be scarred by the sea lamprey.

On August 12, 1959, two 300-foot gill nets ($1\frac{1}{2}$ -, $4\frac{1}{2}$ -inch mesh) were set WNW of Ryan Island in water 72 to 112 feet deep. Water temperatures on this date ranged from 69° F. on the surface to 47.0° F. on the bottom.

The nets, lifted the following day, had captured 36 whitefish, 29 trout, 7 burbot, and 2 Siskiwit Lake cisco, Leuchichthys bartletti Koelz. The trout averaged 22.2 inches in length and 3.1 pounds in weight. The lengths of the whitefish ranged from 7.6 inches to 22.1 inches.

One trout showed evidence of three old scars which did not have the appearance of sea lamprey scars as seen on Lake Superior trout. These small, shallow scars suggest the possibility of native lampreys in Siskiwit Lake.

Note: Leuchichthys hoyi, L. kiyi, L. zenithicus-species of chubs.
Also see Commercial Fisheries Review, October 1959, p. 28.

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SURVEY OF SOUTHEASTERN LAKE SUPERIOR CONTINUED:

M/V "Cisco" Cruise 4: Work during Cruise 4 of U. S. Bureau of Commercial Fisheries research vessel Cisco was carried out in the Shelter Bay-Marquette-Keweenaw Bay area of southeastern Lake Superior. Much of the fishing effort was identical to that of Cruise 2, both as to area and gear.

Regular gangs of gill nets (150 feet each of $1\frac{1}{4}$ and $1\frac{1}{2}$ -inch mesh, 200 feet of 2-inch mesh, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, 3-, $3\frac{1}{2}$ -, 4-, $4\frac{1}{2}$ -, 5-, $5\frac{1}{2}$ -, and 6-inch mesh) were set overnight at 14 fathoms in Shelter Bay; 20, 25, 35, 50, 75, and 100 fathoms off Marquette; and 25, 35, 50, and 80 fathoms in Keweenaw Bay. A total of 24 lake trout was caught (1 in Shelter Bay; 9 at 25 fathoms and 2 at 35 fathoms off Marquette; and 11 at 25 fathoms and 1 at 35 fathoms in Keweenaw Bay). Of these, 13 were marked with spaghetti tags and released. Chub catches off Marquette were light (none at 20 fathoms, 12 at 25 fathoms, 42 at 50 fathoms, and 48 at 100 fathoms) except at 75 fathoms where 126 were taken, the catch at 50 fathoms was appreciably smaller than during Cruise 2. Leucichthys reighardi was the most abundant chub and L. hoyi second most common in the 25-, 35-, and 50-fathom sets off Marquette, and L. kiyi was most abundant in the deeper nets. L. nigripinnis and L. zenithicus were not numerous in any sets. In the Keweenaw Bay area chub catches at 25 fathoms (124), 35 fathoms (227), and 50 fathoms (265) were heavier than during Cruise 2, mostly because of an increase in the number of L. hoyi, which dominated the catches at these depths. At 80 fathoms, however, the 22 chubs taken were fewer than in Cruise 2. Lake herring were scarce in most sets, but 53, averaging 1 pound each, were caught in Shelter Bay where only 4 were netted during Cruise 2. Other species in the gill nets were burbot (a few in several sets off Marquette, none in Keweenaw Bay), and smelt (common only at 25 fathoms in Keweenaw Bay).

Trawls were towed at 100 fathoms northwest of Grand Island, at 50 fathoms off Marquette, and at

several depths from 12 to 25 fathoms in Shelter Bay, 7 to 20 fathoms south of Traverse Island in Keweenaw Bay, and 20 to 45 fathoms off Pequaming in Keweenaw Bay. A single 20-minute tow off Grand Island brought up 141 deep-water sculpins, 1 slimy sculpin, 2 L. reighardi, and 2 L. kiyi. Fairly large numbers of slimy sculpins, and an occasional spoonhead sculpin, smelt, pygmy whitefish, and ninespine stickleback made up the catches in Shelter Bay. No 0-age class lake trout were netted, as has been the case all this year. The tows off Marquette yielded moderate numbers of slimy sculpins and deep-water sculpins, a few L. reighardi and L. hoyi, and a single burbot. The catches off Traverse Island consisted mostly of slimy sculpins and ninespine sticklebacks, except at 7 fathoms where 231 yearling smelt were taken in a 10-minute tow. Off Pequaming in Keweenaw Bay, 44 lake trout between 5 and 10 inches long were caught. Only one was naturally spawned, the others having been stocked in the Bay about 6 weeks previously. The lake trout were most abundant at 33-36 fathoms. Other species in these tows were slimy sculpins, ninespine sticklebacks, smelt, pygmy whitefish, L. hoyi, and L. reighardi. All except smelt were considerably less common than during Cruise 2.

Half-meter nets with large plankton mesh were towed for fish fry in most of the areas visited. Very few fish fry were netted except in Keweenaw Bay and in shallow water (12-16 fathoms) near Marquette. In the latter area smelt fry were at midlevels and an unidentified species, possibly \underline{L} . reighardi, near the surface.

Limnological stations in Shelter Bay, Keweenaw Bay, and off Big Bay Point were visited. Surface water temperature had risen, by the end of the cruise, to about 18°C. (64.4°F.) for several miles out from shore, and to about 15°C. (59.0°F.) 20 miles off Marquette. Extremes were 11.5° and 20.7°C. (52.7° and 69.2°F.). Thermal stratification was noted in all areas, but there were few occasions when there was a sharp thermocline.

Note: Also see Commercial Fisheries Review, September 1959 p. 32, and October 1959 p. 27.

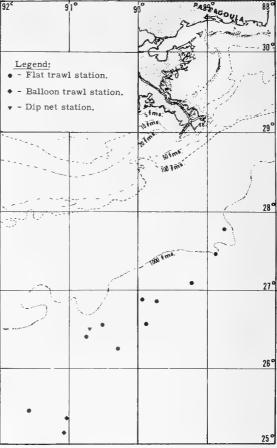


Gulf Exploratory Fishery Program

EXPERIMENTAL DEEP-WATER TRAWLING IN THE CENTRAL AND NORTH-CENTRAL GULF OF MEXICO:

M/V "Oregon" Cruise 60: To obtain more data on deep-water fishing techniques with commercial trawls, the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon made a 9-day cruise to the Central and North-Central Gulf of Mexico. During the cruise that ended on July 31, 1959, 12 bottom tows were attempted in depths ranging from 850 to 1,850 fathoms using 40-foot flat and 30-foot balloon trawls. The principal purpose was to determine the wire size-length ratio for given vessel or current speeds.

Six drags were "successful" in that the trawl reached bottom and returned to the surface without damage or fouling. Three drags were water hauls, two



M/V Oregon Cruise 60 (July 22 to 31, 1959).

resulted in tear ups, and one net was lost. From the appearance of the net and trawl doors, there is some question as to whether the gear was functioning properly on the "successful" hauls. The largest fish catch, which amounted to 25 pounds of mostly large brotulids and macrourids, was made in 850 to 1,100 fathoms. Several species of penaeid shrimp were caught at all depths fished, but in very small numbers. Largest of these have been tentatively identified as Aristaeomorpha and Plesiopenaeus. Several large nonpenaeids were taken in small numbers, including Notostomus and Acanthephyra.

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LAMPARA SEINE TESTED ON FISH SCHOOLS ALONG MISSISSIPPI COAST:

M/V "Oregon" Cruise 61: In an attempt to obtain commercial quantities of fish from schools along the coast of Mississippi, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon tested a lampara seine during a 14-day cruise that ended on September 2, 1959.



A standard 33 by 7-foot menhaden purse boat with 48 hp. engine and equipped with a 2-roller hydraulic gurdy, was used to set and retrieve the seine. Five daylight sets were made using the one boat method. Four daylight and six night sets were made using a 20-foot seine skiff with the purse seine boat, each boat carrying one wing. Night sets were made on fish attracted to lights from a $2\frac{1}{2}$ kw. generator in a light skiff.

Visual spotting from the vessel was used for location of school fish. Steady moderate to fresh winds prevailed throughout the cruise, and no concentrated schools were located. Small catches were made of menhaden (Brevoortia), razorbellies (Harengula), Spanish mackerel (Scomberomorus), ladyfish (Elops), anchovies (Anchoa), and croakers (Micropogon).

Night sets were made on fish attracted by one 1,500-watt light; two lights, 1,500 watts and 750 watts; and two 750-watt lights. Variations noted were: fish attracted with lower intensity lights would be frightened when the 1,500-watt light was turned on; and small fish were attracted more readily with larger fish staying in the "shadows."

* * * * * *

UNDERWATER MOTION PICTURES TO EVALUATE SHRIMP TRAWLS IN ACTION:

M/V "George M. Bowers" Cruises 20, 21, and 22: A series of cruises have been made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers to study shrimp trawls in action with underwater motion picture cameras. The studies are planned to give a complete and detailed underwater picture of shrimp trawls while fishing under a wide range of conditions.

A major objective will be to evaluate the effectiveness of different types of shrimp trawls and their many modifications used by the shrimp industry. A further objective will be to prepare a series of detailed motion picture films on the various trawls for loan to fishermen, net makers, and other interested groups.



Bureau's exploratory fishing vessel George M. Bowers.

The studies are under way along Florida's west coast, between Panama City and Dry Tortugas, and in the Bahamas. Those areas were chosen because of the clear water and suitable bottom conditions. Future studies of trawls on actual shrimp fishing grounds will be made if water conditions are found to be suitable for underwater photography.

Cruises 20, 21, and 22 have provided 8,200 feet of underwater film. Present

plans call for about two years of work to complete the studies.



Massachusetts

AMENDS LAW REGULATING STORAGE AND TRANSPORTATION OF FROZEN FOOD:

The State of Massachusetts on July 17, 1959, amended a law that regulates the storage and transportation of all types of frozen foods, including fishery products.

The law as approved, reads:

"Chapter 94 of the General Laws is hereby amended by inserting after section 73 under the caption FROZEN FOOD the following section: -- Section 73A. No person engaged in the business of storing frozen food or transporting such food shall store or transport such food within the commonwealth unless it is stored or transported under refrigeration which shall insure good keeping qualities and under temperatures and holding conditions approved by the director of the division of food and drugs of the department of public health. Said director may, after public hearing, make regulations for the storing and transportation of frozen food, including temperature control, sanitation and other matters, in accordance with recognized standards necessary for the protection of the public health and the preservation of such food in wholesome condition. The term 'frozen food, 'as used in this section shall include food of any kind which has been preserved by a process of freezing. Nothing in this section shall be construed to apply to delivery of such food by a retailer to the purchaser.

"Whoever violates any provision of this section or of any regulation made hereunder shall be punished by a fine of not more than one hundred dollars for the first offense, and not less than one hundred dollars nor more than five hundred dollars for each subsequent offense."



Mussels

TENNESSEE RIVER POPULATION STUDIES:

Surveys of the fresh-water mussel populations of the Tennessee River indicate that this important commercial resource has been drastically depleted in recent years. Little is known of the life history of the predominant species of these populations, the pigtoe mussel, Pleurobeme cordatum. If populations of this species are to be restored, knowledge of its cycle, growth, and ecology must be acquired.

In 1958 the U. S. Bureau of Commercial Fisheries Pensacola (Fla.) Laboratory began experiments at the Tennessee Valley Authority's abandoned Elk River Fish Hatchery in Limestone County, Ala., to propagate the pigtoe mussel.

Methods of propagation are based upon a peculiar feature of the normal course of development of fresh-water mussels. The very young mussels when firstfreed from the incubation pouches of the parent. with rare exception, must become parasitic upon fish in order to pass through the next stage of their existence. Therefore, if an opportunity occurs after liberation the young mussels or glochidia, as they are called in this stage, attach themselves to the gills, fins, or scales of a fish. The mussels of economic importance attach themselves almost exclusively to the gills. In attaching to or biting on the fish, a slight wound seems to be caused, which begins at once to heal over; but in the process of mending the glochidium is overgrown and, enclosed within the tissues of the fish. The mussel is then an internal parasite and remains in this condition for about two weeks. When the proper stage of development is reached, it frees itself from the host and falls to the bottom. If it finds suitable lodgment it continues its growth to form an adult mussel. Mussels do not attach to fish indiscriminately; for each species of mussel there is a limited number of species of fish which may serve as host.



National Fish Week

PRESIDENT EISENHOWER'S MESSAGE TO FISHING INDUSTRY:

On September 12, 1959, President Dwight D. Eisenhower sent the following message to the National Fish and Seafood Committee:

"The White House, Washington, D. C., Sept. 12.

"F. M. Bundy, Chairman, National Fish and Seafood Week Committee, 1614 Twentieth St., N. W., Washington, D. C.

"You have told me of the National Fish and Seafood Week Committee's plans for the fifth annual observance of Fish and Seafood Week.

"Commercial fishing has long made a vital contribution to our people's diet and to the National economy. As our population continues to grow, we will rely to an increasing extent on the bounty of the sea.

"On this occasion, it is a pleasure to salute the men and women of the American fishing industry.

"/s/ Dwight D. Eisenhower"

This year's "Fish 'n' Sea Food Parade" promotion took place October 12-25

Note: Also see Commercial Fisheries Review, August 1959, front cover and back cover.



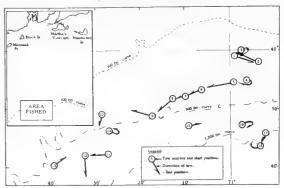
North Atlantic Fisheries Exploration and Gear Research

DEEP-WATER
TRAWLING SUCCESSFUL:

M/V "Delaware" Cruise 59-10: Successful deep-water exploratory trawling was conducted along the continental slope by the U. S. Bureau of Commercial Fisheries research vessel Delaware August 24-29, 1959. Eighteen tows were made during the cruise with the net on the bottom during all except the first two tows. Tows were made at successive depths from 200 fathoms to beyond

1,000 fathoms, spaced at approximately 100-fathom intervals.

A 40-foot Gulf shrimp net, spread by 5-foot chain-bridle shrimp doors, was used on all experimental tows. The doors



M/V Delaware Cruise 59-10 (August 24-29, 1959).

were towed by a 14-fathom bridle from a single warp. The first 400 fathoms of the warp consisted of $\frac{1}{2}$ -inch wire; the remaining 1,450 fathoms was $\frac{3}{4}$ -inch wire. Fishing was conducted on the starboard side from the after gallows.

The main fishing problem experienced with this experimental gear in such deep water was snarling of the net. A large percentage of snarls apparently occurred while setting out, but indications are that this problem can be resolved. No gear loss was reported and little damage to the nets was incurred.

Information concerning the depth ranges of some of the deep-water fauna was gained. The American hake (Merluccius albidus) and long-finned hake (Urophycis chesteri) were found to be present to a depth of approximately 500 fathoms. Thirty pounds of each were taken at Station 9 in a depth of 485-520 fathoms. The common rat-tail grenadier (Macrourus bairdii) occurred in all depths fished. Lobsters (Homarus americanus) were found to occur in depths to 300-350 fathoms. The red crab (Geryon quinquedens) was found from the lower depth range of the lobsters to 1,040 fathoms-the greatest depth reached.

Night-light collections were made, and several rare specimens were collected by cooperating personnel from the U. S. National Museum, Washington, D. C. In cooperation with the Woods Hole Oceanographic Institution, 342 drift bottles were released from 57 stations to assist in an oceanographic program designed to investigate current patterns in the offshore areas.



North Carolina

TAKES ADVANTAGE OF FISHERIES EDUCATION ACT:

Since the beginning of 1959 North Carolina has held 37 classes for a total of 552 vocational-training students on commercial fisheries subjects, ranging from navigation to crab meat picking. The program has been established with funds provided by the Fisheries Education Act of 1956 and administered by the U.S. Department of Health, Education, and Welfare and matching funds from the State.



North Pacific Exploratory Fishery Program

CHUKCHI SEA IN NORTHWEST ALASKA SURVEYED FOR

ATOMIC ENERGY COMMISSION:
M/V "John N. Cobb" Cruise 43: As part of a cooperative program between the U.S. Bureau of Commercial Fisheries and the Division of Biology and Medicine of the Atomic Energy Commission, the Bureau's exploratory fishing vessel John N. Cobb surveyed the resources and commercial potential of the Chukchi Sea during an 8-week cruise that ended on September 11, 1959.

The objectives of this cruise were to determine the types, quantity, and distribution of marine fish and shellfish in the region; to investigate their commercial potential; and to assist the Commission in determining the biological cost of the detonation of nuclear devices in that area. The commission is tentatively planning an experiment in harbor excavation near Cape Thompson, Alaska, as part of the over-all Commission program | Energy Commission. Oceanographic

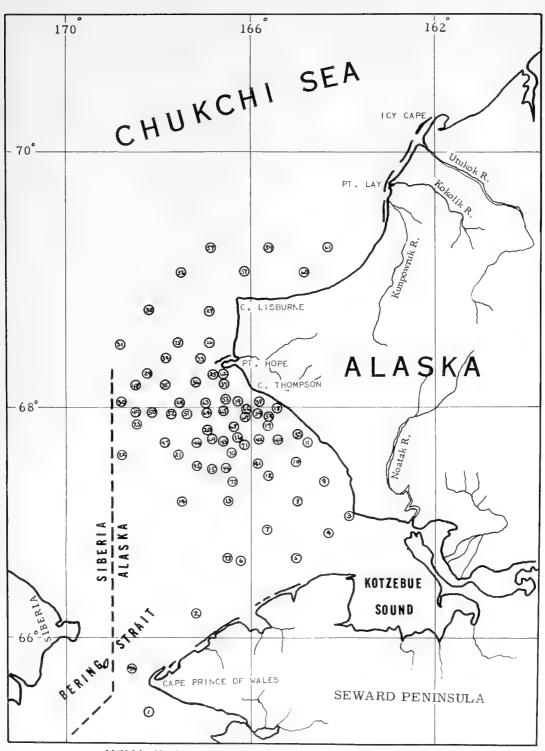
for developing peaceful uses for atomic energy.

During the investigation the vessel cruised in excess of 8,000 miles, 2,500 of which were in the Chukchi Sea. The investigations were carried out in the area from Bering Strait to Cape Lisburne in Northwest Alaska. A total of 59 ottertrawl drags, 36 biological-dredge hauls, and 12 midwater-trawl hauls were made. In addition, investigations were made with gill nets, traps, and a beach seine. Extensive surveys also were made using fish-detecting devices to determine availability of pelagic fishes.

No commercial quantities of bottom fish were taken during the investigation in the Chukchi Sea area. Sole taken in the area appeared to be much smaller than those taken on commercial grounds to the south. One set with a gill net near the Cape Thompson blast site, produced 1,000 herring approximately 10 inches in length. This represented the only catch that indicated possible commercial abundance of pelagic fish in the area. Other hauls made with the midwater trawl and gill nets were not productive.

An extremely rich and varied invertebrate fauna, taken during the investigation, may represent one of the finest collections ever made in Arctic waters. Although no commercial quantities of shellfish were captured, the collections will greatly contribute to the knowledge of animal distribution in Arctic waters. Sighting of mammals in the Arctic waters was not frequent, but several large herds of California grey whales were noted southwest of the Eskimo village at Kivilina, Alaska. The grey whales were noted on four different occasions in the same general region.

Personnel from the Laboratory of Radiation Biology and the College of Fisheries of the University of Washington sampled and monitored fish, shellfish, and bottom deposits throughout the area to determine the extent of background radiation present. Analysis of these data will be continued at the University, and subsequent reports on these findings will be released by the Atomic



M/V John N. Cobb station pattern of Cruise 43 (July-September 1959).

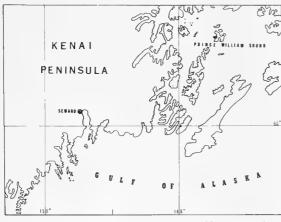
data were collected throughout the investigation. This information will supplement data collected by the University of Washington oceanographic vessel Brown Bear.

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SHRIMP RESOURCES OFF
NORTH-CENTRAL COAST OF

GULF OF ALASKA TO BE SURVEYED:

M/V "John N. Cobb" Cruise 44: The shrimp resources in the waters along the north-central coast of the Gulf of Alaska will be surveyed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. During the October 7-November 20 trip, the vessel



M/V John N. Cobb Cruise 44 (October 7-November 20, 1959).

will explore in bays, inlets, and offshore waters along the Kenai Peninsula from Nuka Bay to Prince William Sound. The objectives will be to determine the distribution, varieties, abundance, and sizes of shrimp during the fall season in that area. Oceanographic and meteorological data will be collected to evaluate possible affects on shrimp distribution. Commercial-type Gulf of Mexico flat shrimp trawls will be used for the exploratory fishing.

This is the tenth Alaska shrimp resources survey carried out by the Bureau since 1950. Cruises in 1957 and 1958 revealed extensive shrimp beds in the Shumagin Islands, Kodiak Island, and Kachemak Bay areas. Last year's findings in the latter two areas are being profitably exploited. The work planned for this fall will provide information

from an area not previously explored. The location of productive shrimp grounds between Nuka Bay and Prince William Sound would considerably aid shrimp fishing activities recently started in the Seward area.



Oysters

LONG ISLAND SOUND SPAWNING AND SETTING OF OYSTERS AND STARFISH:

Regular observations on the occurrence and distribution of shellfish larvae at several Long Island Sound stations, where 200-gallon samples are taken at semiweekly intervals, have shown that since the issuance of the last bulletin, on August 4, the situation has remained virtually the same being characterized by small numbers of bivalve larvae and practically a total absence of oyster larvae. For example, on August 6 no oyster larvae were found in any of the samples. On August 10 the situation was generally unchanged. Two oyster larvae were found at one station, but the total number of bivalve larvae remained low at all stations. Perhaps the finding of a few empty bivalve shells, particularly at one Station, and the fact that several larvae looked as though their shells were partly empty are significant. Possibly these observations indicate mortality or some abnormal condition of the larvae.

For the first time this year mature oyster larvae were found in one of the plankton samples taken on August 13 at one station located in the Milford area. This sample contained four mature larvae. In addition, there were about 3 or 4 smaller larvae, Again this year mature oyster larvae appeared suddenly as though brought in by the currents from other areas not covered by the plankton sampling. It is also important that the plankton sample from one station, collected on August 13, contained not only mature oyster larvae but it also had the highest total number of bivalve larvae and the highest number of species of bivalve larvae seen in any of our samples since July 13, (Observations on Spawning and Setting of Oysters and Starfish in Long Island Sound, Bulletin No. 3, Fishery Biological Laboratory, U. S. Bureau of Commercial Fisheries, Milford, Conn., August 18,)

The first oyster set occurred on August 11. It was extremely light and was recorded only at two stations. This is one of the latest beginnings of setting recorded in the course of the U. S. Bureau of Commercial Fisheries studies, which has extended for a period of about 25 years. Apparently, the larvae that were developed from local spawn either died or were carried away by currents. The larvae were absent from our waters regardless of the observations that the oysters in New Haven Harbor had developed a large quantity of spawn and that the majority were almost completely or more than half spawned by August 6, thus indicating that large numbers of eggs were released. On the other hand, we know that spawning will continue because many oysters at the deeper stations in the Bridgeport area still contain appreciable quantities of spawn and some of them appear to be ripe but unspawned.

Setting of starfish continued, but its intensity remained light. Again, two stations in the Bridgeport area displayed the heaviest set. However, except for the period from August 3 to August 6, when 30 young starfish were recorded on 40 shells at Station 9, the number of starfish per collection period did not exceed ten per station.

The beginning of setting of oysters has been delayed not only in Long Island Sound proper but also in adjacent waters. According to the biologist of the Oyster Institute of North America, who in cooperation with the Bureau is conducting studies on the utilization of salt-water ponds for oyster culture, and who also carries on observations in the open waters of Long Island, the first oyster

set was recorded about August 12 on collectors placed at a depth of approximately 30 feet, north of Paradise Point in Southold Bay. No oyster larvae were previously seen in semiweekly plankton samples nor were any spat discovered on the collectors from that area until the abovementioned date.

Another oyster enemy, the flatworm of the genus Stylochus, appears to be showing a rapid increase in numbers in Long Island Sound waters. We called attention to this predator in one of our 1956 papers and since then our biologists have observed its occurrence and behavior in several locations. This year in one of our experiments in Milford Harbor, where laboratory-grown oyster set was used, over 30 percent of the young oysters, in some instances, were found dead with the worms still inside of the shells.

In the near future the Bureau's laboratory, in cooperation with biologists of other groups of the Bureau of Commercial Fisheries and the Connecticut Shell Fish Commission, will begin a series of studies devoted to observations on the behavior of starfish under normal conditions and to the development of chemical methods to control them. Several biologist-SCUBA divers of the Bureau and an underwater television technician of the Woods Hole Biological Laboratory are helping. The State Shell Fish Commission is also cooperating by offering the oyster-spawning bed in the Milford area for these studies and the use of the State boat Shellfish.

Note: Also see Commercial Fisheries Review, October 1959, p. 35.

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STUDIES IN MARYLAND AND CONNECTICUT:

Maryland: The research of the U. S. Bureau of Commercial Fisheries Annapolis (Md.) Fishery Biological Laboratory is centering this year on the pattern of oyster setting in horizontal and vertical levels in a seed area of southern Maryland. Early indications are that the setting will be light and not of commercial significance in the experimental area. Evaluating the effect on oyster seed of a predatory flatworm, Stylochus ellipticus, recently found in these waters, is a part of the project. The occurrence of the worm was also light this summer.

Hydrographical and biological observations are being conducted in the waters surrounding the Oxford, Md., Laboratory site. The oyster-setting portion of these observations showed light spatfall during July. This, however, is a condition observed elsewhere in Maryland waters and indicates a general light setting this season.

Connecticut: Observations on spawning and setting of oysters and starfish in Long Island Sound began in July. Setting of starfish began July 2 and is continuing; however, it is not too heavy. No setting of oysters has been recorded.

Although spawning occurred long ago, practically no oyster larvae have been found in the plankton samples.

In developing methods of larval culture of commercial mollusks several more antibiotics were evaluated on their ability to control undesirable bacteria that cause larval diseases. Achromycin, a preparation of tetracycline, gave promising results.

About 3.5 million oyster larvae were reared to the setting stage and released in experimental ponds.

Experiments on developing chemical barriers to control shellfish enemies made good progress.

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USE OF PLASTIC SHEETS FOR CONVERSION OF SOFT, MUDDY BOTTOMS INTO OYSTER BEDS:

Many bottom areas and estuarine regions are too soft to support oysters or their shells. To convert these areas into oyster beds thousands of bushels of oyster shells have to be planted on each acre to harden the bottom. This an expensive undertaking, rendering the method virtually impractical. Nevertheless, problems of this nature have to be met in extensive areas along our coast when establishment of oyster beds is desirable in regions where the bottoms are too soft.

The problem can be solved by covering soft bottoms with a thin sheet of polyethylene or some other plastic material to serve as a support for oyster shells, other set collectors, seed oysters, or spawners. Some plastics are neutral, virtually indestructible materials which last many years. We have used polyethylene for years in our experiments and have found it extremely durable. It is inexpensive—sheets costing less than one cent per square foot if purchased in large quantities.

In the spring of 1958 an experiment was undertaken on the mud flats in Milford Harbor where a polyethylene sheet (6 mils thick and 20 feet wide) was spread on the bottom in such a manner that half of it was above and half below the mean

low-water mark (fig. 1). Soon after that, large quantities of oyster shells, loose and in special chicken-wire bags, were placed on the polyethylene. An extremely heavy set of oysters occurred on the shells resting on the plastic. This was also true for nearby areas, where oyster shells were resting directly on the bottom because of the unusually heavy oyster set that occurred that year in

In addition to converting soft bottoms into usable ones, polyethylene sheeting can be used for still another purpose. For example, recent literature contains several remarks made by oyster biologists, especially the Japanese, concerning a gradual deterioration of good oyster bottoms after being used for some time. They ascribe this to the accumulation of molluscan waste products which



A polyethylene sheet serves as a support spread on soft, muddy bottom for oyster shells.

Long Island Sound and its tributaries. However, heavy setting on the shells placed directly on the plastic corroborated our earlier laboratory observations showing the lack of adverse effects of polyethylene on oyster larvae and set.

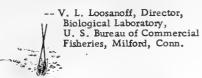
Continued observations indicated that the polyethylene sheet withstood seasonal changes very well and that even the severe winter of 1958/59, when the tidal flats froze frequently and large quantities of ice were formed in Milford Harbor, did not noticeably affect the plastic material. A year after the sheet was first placed in the water, the plastic showed no signs of deterioration and continued to support the heavy load of shells and oysters.

gradually decompose, rendering the bottom toxic to oysters. Such areas could probably be restored to their former productivity by covering them with polyethylene sheeting or similar material, which would isolate oysters from the deleterious effects of polluted bottoms.

Still other uses of polyethylene sheeting suggest themselves. One, perhaps, is that of creating favorable conditions in specially-designed ponds and tanks for the cultivation of commercial species of sponges. The material can also be used for protecting the bottoms of oyster dikes and claires (small enclosed oyster ponds) from burrowing crustaceans, such as members of the genus Upogebia, and also for retaining the water in claires

built in areas where the natural soil is too porous.

Note: I wish to thank my colleagues, H. C. Davis and P. E. Chanley, for their help in establishing the experimental, plastic-covered bed in Milford Harbor.



Pacific Herring

AERIAL SPAWNING SURVEYS IN ALASKA:

The method of conducting Pacific herring spawning surveys on definite patterns by aircraft, which was instituted in 1957, was again used in the spring of 1959 in Alaska. Spawning beaches observed were charted during flights and miles of beach utilized for spawning computed.

During the aerial surveys from March 16 to May 19, 141.4 hours of flying time were expended and 20,170 miles of beach observed. Spawning was charted on 133.7 miles of shoreline. Insofar as spawning miles were concerned, the Ketchikan-Craig district accounted for 16.5 miles, the Sitka district 93.3 miles, and the Juneau district 24.1 miles. Calculations based on egg density, area, and herring fecundity indicate a minimum of 65,500 tons of herring contributed to the spawning observed.

Aerial spawning surveys were conducted in Prince William Sound also--12.9 miles of spawn were recorded. No surveys were conducted in Kodiak this year.

Ground surveys were made in 46 separate areas in southeastern Alaska and accounted for about 16 percent of all spawning observed.

Studies, conducted on subtidal and reef spawning in the Craig area, indicate it can be rather extensive.



Sardines

CALIFORNIA SARDINE CATCH DROP FORECAST FOR 1959:

Provided the tie-up over the ex-vessel price disagreement between producers and canners and other economic factors do not exert a depressing effect upon fishing operations, the California sardine landings during the 1959 season can be expected to be only slightly less than the 101,567 short tons landed in 1958. In 1957 only 20,455 tons were landed. This forecast was announced at a conference held in La Jolla, Calif., on July 28-30. The conference was attended by representatives from the California Department of Fish and Game, Scripps Institute of Oceanography, the U. S. Bureau of Commercial Fisheries, California Academy of Sciences, and Hopkins Marine Station for the purpose of reviewing their contributions to the California Cooperative Oceanic Fisheries Investigations. Industry members and other government officials attended also.

The information developed by the California Department of Fish and Game suggests that without economic restrictions the catch in Southern California waters should be about 67,000 tons. About 27,000 tons could be caught off central California (north of Pt. Arguello). The total California commercial sardine catch could reach about 94,000 tons; however, economic factors and fleet tie-ups may keep the catch down.

The percentage age composition of the catch should be about as follows:

	1	Year	-Class	
Area	1957	1956	1955	1954+
California:		(Per	cent)	
Southern	61 64	33 36	5	1

The programs carried out by the U. S. Bureau of Commercial Fisheries suggest that the availability of sardines will be about the same as last year. This is judged because the amount of spawning and the distribution of spawning is about like last year, and there are no indications of outstanding year-classes entering the fishery. A note of caution must be injected, however, because of indications of cooling of the ocean to the north. A marked persistent cooling might cause the sardines to be further south than last year.

At Monterey, 4 out of 6 canneries settled with sardine fishermen on September 1 to pay \$35 ex-vessel for sardines landed at Monterey on a trial basis for about a week. One small sardine canner at Oxnard also settled at the same price. But in southern California no agreement had been reached as of September 1. The central California season opened August 1 and the southern California season September 1, but the boats have been tied up at the dock pending the settlement of the ex-vessel price.

On September 2 about 360 tons of sardines were caught and delivered to the four canneries at Monterey that have agreed to pay \$35 aton. Fishermen reported fish plentiful in Monterey Bay with seiners catching large sardines packing 5 to 6 fish per pound can.

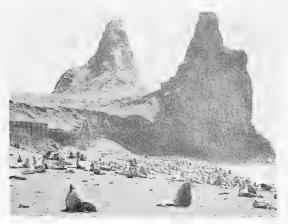


Sea Lions

ALASKA SEA LION STUDIES:

Biological studies on the sea lions in Alaska were conducted during the past three years by the Fishery Research Institute of Seattle under a contract from the U. S. Bureau of Commercial Fisheries. As a result of the research much was learned concerning the distribution, abundance, feeding habits, general biology, and methods of harvesting sea lions.

The sea lion is a predator on salmon and halibut and at times causes considerable damage to fishing gear.



Sea lions on breeding grounds, Bogoslof Islands, Alaska.

Efforts were made this year to determine if their numbers might be reduced by initiating a commercial fishery for these animals. A total of 616 sea lions was killed and about 100 tons of sea lion meat and 18,000 pounds of livers were rendered. The meat is expected to be sold for mink feed or to canners of pet food.

The killing of the 616 sealions was the result of a \$50,000 contract awarded to a Pacific Coast fish-packing firm by the U.S. Bureau of Commercial Fisheries. The fishery company sent its freezership Arctic Maid for a two-months study near Kodiak Island and westward to the Aleutians.



Tuna

FROZEN TUNA TRANSFERRED FROM FISHING VESSEL TO CARGO SHIP AT SEA:

A United States west coast tuna-packing company made a trial transshipment of frozen tuna in Panama Bay off Taboga Island September 5, 1959. The chartered refrigerated cargo ship, Maria Horn,

anchored some 200 yards off Taboga Island which has a protective deep-water cove. The company's two tuna vessels, the Westport with 230 tons and the Missouri with 240 tons of frozen tuna aboard, tied up alongside the Maria Horn, one aft and the other forward. Using ships' gear and cargo nets, the transfer of the frozen tuna was made without incident.

The open-sea transshipment is estimated to have saved the company some \$2,000. A total of 48 stevedores from Panama City and 32 native laborers from Taboga Island were used in the operation. The wage scale paid was 90 cents an hour to the gang foreman, 75 cents an hour to winchmen, and 50 cents an hour to stevedores. Time-and-a-half was paid for Sunday work.

The company is studying the feasibility of operating its tuna fleet of 20 boats from a base on Taboga Island. The company would expect eventually to establish dock facilities and a freezing plant of some 2,500- to 3,000-ton capacity on the Island.

In 1956 a shrimp company initiated construction of a fish-meal plant on this sheltered cove of Taboga Island. It was the first of a three-stage program providing for a shipyard with dry docks, marine railroad and supply base, and a shrimp-freezing plant. The fish-meal plant was completed but operation has been limited for lack of an adequate fish supply. Further construction was deferred in view of the reversal in the Panama shrimp industry and the company's extension of operations to Ecuador. The United States tuna company would probably acquire the site of the shrimp company as building areas are limited on this small resort island. An adequate fresh-water supply is lacking. (United States Embassy, Panama, September 11, 1959.)

* * * * *

UNITED STATES-JAPANESE GOVERNMENTAL

TUNA CONFERENCE:
The U, S, Interior, State and Commerce Departments have indicated qualified approval of the tuna industry's proposal for government-to-government talks on tuna between the United States and Japan. The following letter, signed by representatives of the three government departments, was mailed towards the end of August 1959 to those concerned with the meeting in the United States:

"Representatives of the Departments of Interior, State and Commerce have examined with great care the plan of action for talks on tuna between the United States and Japanese Governments submitted on July 8 by representatives of the Southern California tuna industry. Equally careful consideration has been given to the views expressed by other representatives of the tuna industry and to statements submitted to the interested agencies subsequent to the meeting on July 8.

"The plan of action submitted on July 8 contained a recommended series of agenda items for the proposed tuna conference under the following headings: (1) conservation; (2) efficiency of harvesting; (3) quality of production; (4) efficiency of marketing; (5) market research and development; and (6) Japanese price and volume controls.

"The above mentioned Departments have concluded that certain objectives of the tuna industry might appropriately be sought and promoted by informal discussions between representatives of the United States and the Japanese Governments under the first five of these headings. It will, of course, be necessary to reach agreement on the details of an agenda.

"We have concluded, however, that it would not be desirable to include in any discussions between governments the subject of future Japanese price and volume controls. Japanese exports of fresh and frozen tuna and canned tuna to the United States are presently subject to unilateral controls. The proposed plan of action refers by implication to the fact that at the present time Japanese exports to the United States of certain types of cotton textiles are subject to voluntary controls at certain specific levels. It is apparently with this arrangement in mind that the plan of action refers to the establishment of a precedent for industries other than tuna similarly affected by Japanese imports. It is true that this Administration has discussed with the Japanese Government its program of control over exports of textiles. However, this program is regarded as an exceptional one and not as establishing a precedent for similar action in other cases, including the tuna industry.

"The interest of the tuna industry in government-to-government discussions of Japanese price and volume controls affords an opportunity to make clear the policy of the Administration with respect to the question of intergovernmental agreements for the voluntary control of exports to the United States. As you know it is the policy of the United States Government to encourage free competitive enterprise, both domestically and internationally. Negotiated voluntary controls are in basic conflict with that policy. It has been the experience of our Government that negotiation of "voluntary" controls over exports does not result in satisfaction to the industries seeking the controls, or those industries dependent upon access to imported materials, or domestic consumers, or the foreign governments involved.

"The plan of action submitted by the Southern California tuna industry is regarded as a helpful attempt to move forward, in cooperation with appropriate government agencies, in a constructive program for the improvement of the situation in the tuna industry. The plan of action stated the belief of the industry that a conference would be eminently worthwhile irrespective of the range of subjects that the Administration might feel should be recommended to the Japanese Government for discussion at this time. On that basis, the United States Government proposed to the Japanese Government that informal discussions be held as indicated in the third paragraph in this letter, with the specific understanding that the discussions will not deal in any way with future price or volume controls.

"The Japanese Government has now agreed in principle to an intergovernmental meeting, and it is anticipated that they will be able to give their formal agreement as soon as the agenda has been mutually approved. The Government is prepared to invite a limited number of representatives of the tuna industry to attend the meeting as members of the United States Delegation.

"If you agree that government-to-government discussions on the basis indicated in this letter would be beneficial to the tuna industry, it would be appreciated if you would so indicate in your acknowledgment of this letter. Copies of this letter are being sent to all participants in the July 8 meeting and their views are likewise being requested.

"In conclusion, it should be understood, of course, that none of the actions discussed in this letter affect in any way the applicability of the antitrust laws of the United States and the Order of the Federal Trade Commission in Docket No. 6623, July 24, 1957, so far as they may be relevant.

"Sincerely yours.

''Ross Leffler ''W.T.M. Beale
Assistant Secretary of Interior
for Fish and Wildlife of State
for Economic Affairs

"Bradley Fisk
Deputy Assistant Secretary of Commerce
for International Affairs"

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the $12\frac{1}{2}$ -percent rate of duty is 52,372,574 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-August 29, 1959, amounted to 31,345,084 pounds, according to data compiled by the Bureau of Customs, January 1-August 30, 1958, a total of 31,034,647 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.



United States Fishing Fleet $\frac{1}{2}$ Additions

JULY 1959:

A total of 60 vessels of 5 net tons and over were issued first documents as fishing craft during July 1959--a decrease

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, July 1959									
Area	Ju	ly	Jan, -	-July	Total				
Area	1959	1958	1959	1958	1958				
		(Number)					
New England	2	- 1	10	10	13				
Middle Atlantic	1	2	6	9	13				
Chesapeake	11	11	56	55	99				
South Atlantic	15	15	59	76	135				
Gulf	12	29	88	178	270				
Pacific	11	18	70	84	112				
Great Lakes	-	2	5	5	10				
Alaska	. 8	1	28	24	31				
Virgin Islands		-	-	1	1				
Total									
Note: Vessels have been assigned to the various areas on									
the basis of their ho	me por	ts.							

1/ Includes both commercial and sport fishing craft.

of 18 vessels compared with the same month last year. The South Atlantic area led with 15 vessels, while the Gulf area was second with 12 vessels, followed by the Chesapeake and Pacific areas with 11 vessels each.

Table 2 - U	J. S	Ve	ssels	Issued	First Do	cuments	as Fishing
Craft by Tonnage, July 1959							
Net Tons							Number
5 to 9							27
10 to 19							16
20 to 29							9
30 to 39							44
40 to 49							1
50 to 59							3
Total							60

During the first seven months of 1959, a total of 322 vessels were issued first documents as fishing craft--120 below the same period of 1958. Most of the decline occurred in the Gulf area where 90 fewer vessels were documented in 1959 than in 1958.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during July 1959 increased 16.7 percent in quantity, but dropped 0.7 percent in value as compared with June 1959. The increase was due primarily to higher imports of groundfish fillets (up 10.8 million pounds) and frozen albacore and other tuna (up 3.4 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine. The increase was partly offset by a 1.9-million-pound-decrease in the imports of lobster and spiny lobster.

U. S. Imports of Edible Fishery Products, July 1959 with Comparisons							
_	Q	uantit	У		Value		
Item	Jul		Year	Ju		Year	
			1958_				
	(Mill	ions of	Lbs.)	(Mi	llions	of \$)	
Imports: Fish & shellfish: Fresh, frozen, & processed 1/	93.4	100.7	956.8	27.0	28.3	278.4	
Exports: Fish & shellfish: Processed only 1/ (excluding fresh & frozen)	6.2	1.9	41.2	1.4	1.0	15.6	
1/Includes pastes, saud and other specialtie	es, cl			and ju	iice,		

Compared with July 1958, imports in July this year were lower by 7.3 percent in quantity and 4.6 percent in value due to lower imports of frozen albacore tuna (down 7.1 million pounds), groundfish fillets (down 3.3 million pounds), and canned sardines not in oil (down 3.2 million pounds), Compensating for the decline was an increase of about 6.0 million pounds in the imports of frozen tuna other than albacore and frozen shrimp (up 1.6 million pounds).

United States exports of processed (mostly canned fish and exclusive of fresh and frozen) fish and shellfish in July 1959 were up by 37.8 percent in quantity and 7.7 percent in value as compared with June 1959. Compared with the same month in 1958, the exports this July were higher by 226.3 percent in quantity and only 40.0 percent in value. The higher exports in July this year were due to increased exports of canned California sardines, salmon, and squid. Those products accounted for about 90 percent of total exports of processed fish and shell-fish in July this year.

* * * * *

EXPORT TRADE PROMOTION SERVICE INITIATED BY COMMERCE DEPARTMENT:

The inauguration of a new trade promotion service as part of a program to increase United States export sales was announced by the Assistant Secretary of Commerce for International Affairs.

To put prospective buyers in speedy touch with their local sources of supply for United States products, the Commerce Department's Bureau of Foreign Commerce is asking United States manufacturers and exporters to fill out a 3 x 5 card identifying each of their agents and licensees in foreign countries. These cards will be transmitted by that Bureau to U. S. Foreign Service Posts to be used as part of an "Agency Index" for ready reference when United States commercial officers are asked the important question: "Where can I buy a specified United States product?"

United States Foreign Service Officers handling commercial matters abroad

frequently are asked, both by businessmen and foreign government representatives, how purchase of United States products can be made. Although overseas representatives of many firms are well known to U. S. Foreign Service Posts, complete listings usually are not available. By having at their fingertips the names and addresses of agents or licensees, commercial officers serving the interests of United States firms abroad will be able to place before potential customers information on all local



sources of supply. If a buyer is interested in a trademarked product or replacement equipment, the name of the representative on the scene can be supplied readily.

The 3 x 5 cards (Form FC-30) may be obtained from any of the Commerce Department's 33 field offices or from the Commercial Intelligence Division, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C. The data furnished by United States firms will not be published.

The Assistant Secretary of Commerce said that vigorous competition in foreign trade today demands greater cooperative action between Government and private business, and the new Agency Index service is one means by which the Government can better serve the needs of private business, particularly small business.

All firms having representatives or licensees abroad should take advantage of the Agency Index service.

* * * * *

GROUNDFISH FILLET IMPORTS, AUGUST 1959:

Imports of groundfish (including ocean perch) fillets and blocks into the United

States in August 1959 amounted to 15.1 million pounds -- a gain of 421,000 pounds or 3 percent as compared with August 1958. Canada continued to lead all other countries in these imports with 9.9 million pounds--a decline of 180,000 pounds as compared with the corresponding month of last year. Iceland was second with 2.3 million pounds--1.4 million pounds below August 1958. Denmark followed with 1.6 million pounds -- a gain of 1.1 million pounds over the same month last year. The remaining 1.3 million pounds were imports from Norway, West Germany, Greenland, the United Kingdom, Miquelon and St. Pierre, and the Netherlands.

During the first eight months of 1959, total imports of groundfish and ocean perch fillets and blocks into the United States amounted to 119.9 million pounds. Compared with the same period of 1958, this was a gain of 14.9 million pounds or 14 percent. Canada (58.2 million pounds) accounted for 49 percent of the 1959 eightmonths total. Imports from Iceland --32.8 million pounds -- made up 27 percent of the total, while Denmark was next with 13.6 million pounds or 11 percent, followed by Norway with 10.0 million pounds or 8 percent. Seven other countries accounted for the remaining 5.3 million pounds or 5 percent.

Note: See Chart 7 in this issue.



Wholesale Prices, September 1959

Due primarily to higher wholesale prices for large drawn haddock, fresh shrimp, and canned pink salmon, the September 1959 wholesale price index for edible fishery products (fresh, frozen, and canned) rose about 1.7 percent from the preceding month, but was lower by 6.4 percent as compared with September a year ago.



Shorter supplies of large haddock at Boston and light receipts of Lake Superior drawn whitefish at Chicago were responsible for the increase of 5.1 percent in the index for the drawn, dressed, and whole finfish subgroup from August to September this year. The sharp rise (40.3 percent) in the exvessel price of large drawn fresh haddock and a 13.3 percent increase in the drawn whitefish price were partly offset by

some declines in the wholesale prices for frozen halibut, fresh round yellowpike, and round whitefish at New York. Compared with September a year ago, the subgroup index this September was up slightly (1.1 percent). Lower wholesale prices for western halibut and whitefish at New York were more than offset by higher prices for the balance of the items in this subgroup.

Fresh processed shellfish prices in mid-September 1959 were higher by 3.3 percent than the previous month. Fresh headless shrimp prices were higher by 4.0 percent and shucked oysters up by 4.2 percent. On theother hand, fresh small haddock fillet prices declined 6.8 percent from August to September this year. The fresh processed fish and shell-fish subgroup index this September dropped by 12.7 percent from the same month of 1958 because of sharply lower whole sale prices for haddock fillets at Boston (down 25.8 percent) and fresh headless shrimp (down 24.0 percent) at New York City. However, due to scarce supplies of oysters, prices were up about 4.2 percent from September 1958 to September this year.

The continuing weakness in the market for frozen shrimp was responsible for the decline of 4.5 percent in the September 1959 index for the processed frozen fish and shellfish subgroup as compared with the preceding month. Frozen shrimp prices at Chicago declined about 5 cents a pound or 8 percent

during this period. In addition, a drop of 1.4 percent occurred in frozen flounder fillet prices from August to September this year. From September 1958 to September this year all subgroup items were priced lower and resulted in a 20.4 percent decrease in the subgroup index. In September this year frozen haddock fillets were lower by 17.7 percent, frozen flounder fillets down by 9.8 percent, ocean perch lower by 6.8 percent, and frozen shrimp down 26.6 percent.

Canned fish prices rose again (1.4 percent) in September this year from the preceding month. By mid-September 1959 earlier predictions of a very small canned salmon pack were realized and prices jumped about 3.1 percent at Seattle. Other canned fish prices this September were unchanged from the preceding month. Compared with September of last year, prices this September were up 1.5 percent due to higher canned salmon prices (up 16.6 percent) and canned Maine sardine prices (up 6.4 percent). These increases from September 1958 to this September offset a decline of 9.6 percent in canned tuna and a 28.8 percent in canned California sardine prices. The dispute between the sardine fishermen and canners over ex-vessel prices was settled on October 3, but prospects of the California sardine fleet attaining the predicted catch of 100,000 short tons appeared remote as of the end of September. The pack of Maine sardines for the 1959 packing season will be lower than the less than average pack made in 1958.

Table 1 - Wholesale Average Prices and Indexes fo	r Edible Fish	and :	Sh ellf is	h, Septem	ber 1959	With Co	mpariso	ns
Group, Subgroup, and Item Specification	Point of Pricing	Unit		rices 1/		Indexes (1947-49=100)		
			Sept. 1959	Aug. 1959	Sept. 1959	Aug. 1959	July 1959	Sept. 1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.8	119.8	123.0	130.1
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, Ige. & med., drsd., fresh or froz. Whitefish,L. Superior, drawn, fresh Whitefish,L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh		lb. lb. lb. lb. lb. lb. lb.	.15 .33 .80 .73 .73 .73	.11 .35 .80 .64 .80 .83	135,2 159,9 153,1 101,1 179,7 179,7 146,7 170,0	132,8 152,2 109,1 107,8 179,7 158,6 161,8 193,5	139.0 160.2 169.5 103.6 171.3 151.2 159.8 190.0	150.0 158.1 151.9 113.2 174.2 161.1 200.2 140.7
Processed, Fresh (Fish & Shellfish): Fillets, haddock, sml., skins on, 20-lb, tins. Shrimp, lge. (26-30 count), headless, fresh Oysters, shucked, standards.	Boston New York Norfolk	lb. 1b. gal.	.35 .67 6.25	.37 .64 6.00	125.5 117.4 105.1 154.7	121.5 125.9 101.1 148.5	123.0 139.5 104.3 145.4	143.8 158.2 138.2 148.5
Processed, Frozen (Fish & Shellfish): Fillets: Flounder, skinless, 1-lb, pkg. Haddock, sml., skins on, 1-lb, pkg. Ocean perch, skins on, 1-lb, pkg. Shrimp, lge. (26-30 count), 5-lb, pkg.	Boston Boston Boston Chicago	lb. lb. lb. lb.	.37 .33 .27 .64	.38 .33 .27 .69	107.2 96.8 102.0 108.8 98.0	112.3 98.2 102.0 108.8 106.5	120.9 102.1 105.2 112.8 118.4	134.7 107.3 124.0 116.8 133.5
Canned Fishery Products: Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	Seattle Los Angele Los Angele New York		10.80 7.50	23.75 10.80 7.50 8.75	103.4 127.8 77.9 88.1 93.1	102.0 123.9 77.9 88.1 93.1	100.5 122.6 77.9 85.1 87.8	101.9 109.6 86.2 123.7 87.5

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.





International

CUBA-UNITED STATES CONVENTION FOR CONSERVATION OF SHRIMP:

The United States and Cuba on September 4, 1959, exchanged instruments of ratification bringing into force the Convention for the conservation of shrimp which had been signed by representatives of the two countries on August 15, 1958. The United States President, acting upon the advice and consent of the Senate, ratified the Convention on the part of the United States on June 12, 1959.

The Convention has for its purpose scientific research and the adoption of conservation measures affecting shrimp harvested by fishermen of the two countries in the Gulf of Mexico off the coasts of Cuba and Florida. The region involved has been one of the important shrimp areas of the Gulf. During the past few years the percentage of small shrimp from these grounds has been increasing, suggesting the possibility that a substantial part of the yield is being taken before the shrimp have reached the larger, more commercially desirable sizes. Under the terms of the Convention the United States and Cuba will conduct studies to learn the facts and take necessary action to maintain this resource at the most productive level for the benefit of both countries.

This is the ninth international agreement by means of which the United States is now cooperating with neighboring countries in the conservation of fishery resources. All but one of these agreements, the Great Lakes Fishery Convention with Canada, affect high-seas fisheries. One, the Whaling Convention (15 nations), is worldwide in scope. The others encircle our country, starting with the Northwest Atlantic (12 nations), crossing the Continent to the fur seals

of the North Pacific (4 nations), the halibut of the North Pacific, and the salmon of the Fraser River in British Columbia (United States and Canada). A tripartite agreement between the United States, Canada, and Japan covers all fishery resources of common concern to these three nations in the North Pacific. The Tuna Convention with Costa Rica and Panama deals with the tunas of the eastern tropical Pacific.

The United States has now joined with Cuba in another of these international undertakings between friendly nations for the preservation of fishery resources of common concern, to the benefit of both.

FISH MEAL CONFERENCE HELD IN SPAIN

Fish meal is increasingly recognized throughout the world as the most valuable protein ingredient produced in substantial quantity and used as a supplement in animal feeds. Production throughout the world has very substantially increased in recent years, particularly from the new producing countries of South Africa, Portugese Angola, Chile, and Peru. Demand exceeds supply so that the world's producers are continually trying by new techniques to produce every extra ton possible. Raw material on which the industry depends is both whole fish and the fish-processing waste.

Fish meal is principally used as a growth food for young animals. The great increase in the broiler industry owes much of its success to the use of fish meal. Most of the European manufacturing countries, other than Norway and Denmark, use all their home-produced meal in their own countries and import large quantities. Britain is the largest user of fish meal in Europe, while the United States is the largest user in the world.

Some years ago, the President of the French Fish Meal Manufacturers' Association suggested that in view of the growing importance of this industry, the rapid development of new techniques, and the greatly increased demand, it would be good to have a conference so that manufacturers could discuss their problems: subsequently a conference attended by the manufacturers from most European countries was held in Paris in 1952 and was the first of a series of very successful conferences.

Since the first conference, the British Association of Fish Meal Manufacturers has organized each conference and has been the host at two of them--1955 and 1956. Norway was the host the following year and last year's conference was held in Cape Town with South Africa as the host.

The scope of the conference is now widened to include not only European manufacturers, but producers overseas and those countries who have been represented at the

International (Contd.):

conferences include Angola, Belgium, Canada, Denmark, Germany, Great Britain, Holland, Iceland, Morocco, Norway, Portugal, Spain, Sweden, and the United States. In October of 1959, the conference was held in Madrid at the invitation of the Spanish manufacturers.

At the request of the Spanish manufacturers, the British Association of Fish Meal Manufacturers made the arrangements for the Madrid conference and the large and interesting agenda showed that scientific and technical matters occupied a large part of the discussions.

The series of conferences has produced a high degree of cooperation amongst the countries concerned who discuss their problems in a friendly informal atmosphere. This has already led to considerable interchange of information. The next step in the evolution of this industry may be to produce a human food.

Already fish meal or fish flour is being used in some countries where the standard of human nutrition is low and the high biological quality of this food is proving its worth in improving the diet of the people of those countries.

EUROPEAN COMMON MARKET

FISHERY ASSOCIATIONS FORMED:

A large number of associations have already been formed within the framework of the European Economic Community. The gradual harmonization over a period of years of the economic and social policies of the Six will affect commerce and industry in each country, and the primary purpose of these groupings is to study the implications of these changes and make preparations to meet them. The activities of the associations range from round-table discussions held from time to time to the establishment of a formal set-up with a permanent secretariat. Among the many associations formed representing every type of industry or business are the following on or of interest to fisheries:

Animal Feeds:

2/Preliminary.

Fédération Européene des Fabricants d'Aliments Composés pour Animaux 27 rue des Paroissiens Brussels, Belgium

Edible Oils:

Association des Huileries du Marché Commun 121 rue Royale Brussels, Belgium.

Fish:

Association des Industries du Poisson de la CEE 55 rue de la Loi Brussels, Belgium.

Quite a number of associations on food distribution were also formed.

MARINE OILS

WORLD PRODUCTION AND EXPORTS OF MARINE OILS EXPECTED TO DROP IN 1959:

World production and exports of marine-animal oils (whale, sperm whale, fish-body, and fish-liver oils) will be less in 1959 than in 1958. (See table.)

Exports of marine oils in 1959 probably will fall short of last year's volume chiefly because of smaller production of whale and sperm oil. The 1958/59 Artaarctic season was less successful than the previous season. Although more whales were killed, the yield of oil per unit was down sharply. Fish oil exports may approximate 1958 tonnage. European exports may decline mainly because Norway's spring herring catch was far below average although above the exceptionally low output in 1958. This decline may be offset by the increase in United States exports which now appears likely.

Estimat	ed World P	roduction,	and Expor	ts of Mai	ine-Anim	al Oils, I	Forecas	t 1959,		
	Annual 1	لــــــــــــــــــــــــــــــــــــ	and Av	erages 1	935-39 a	nd 1950-	54	•		
	Forecast		1						Λ	rage
Commodity	1959	19582/	1957	1956	1955	1954	1953	1952	1950-54	
				(.,000 Sho	rt Tons) .				
Production:				,	ľ	1 ′				
Whale	415	435	430	425	420	455	420	460	440	545
Sperm whale	115	125	110	120	100	75	55	85	80	30
Fish (including liver).	490	470	485	565	540	520	460	460	470	480
Total	1,020	1,030	1,025	1, 110	1,060	1,050	935	1,005	990	1,055
Exports:										
Whale	415	435	430	425	420	455	420	460	439	545
Sperm whale	115	125	110	120	100	75	55	85	78	30
Fish (including liver).	200	200	190	200	205	215	195	134	177	135
Total	730	760	730	745	725	745	670	679	694	710
1/Beginning with 1950 the		ted are the	se in wh		redomina	nt share o	f a giv	en oil wa	s produced	

Note: Compiled from official and other sources. Revised from previous data issued.

International (Contd.):

TRADE AGREEMENTS

ANGOLO-SOVIET AGREEMENT INCLUDES FISHERY PRODUCTS:

The five-year Anglo-Soviet Trade Agreement, signed on May 24, 1959, contains a provision for an increase each way in the exchange of consumer goods for the first year of the agreement. New quotas have now been established following negotiations between the Board of Trade and the Soviet trade delegation in London and made public August 28, 1959. The quotas are, of course, only targets, and their fulfillment depends upon the demand for the items in the two countries, and, to a lesser extent perhaps, upon the ability or desire to supply the items.

In the quotas for United Kingdom goods to be exported to the Soviet Union are included herring valued at £250,000 (US\$702,500) f.o.b. and white fish valued at £550,000 (\$1,545,500) f.o.b.

Quotas for Soviet goods to be exported to the United Kingdom include canned crabmeat valued at £1,000,000 (\$2,810,000) f.o.b., canned salmon valued at £500,000 (\$1,405,000) f.o.b., and caviar (including red caviar) valued at £85,000 (\$238,900) f.o.b. In addition licenses for £550,000 (\$1,545,500) c.i.f. of Soviet canned salmon will be issued by the United Kingdom under arrangements which have been made outside the consumer goods agreement. (United States Embassy, London, report of September 3, 1959.)

WHALING

JAPANESE WITHDRAW PROPOSAL TO REDUCE NUMBER OF CATCHER BOATS:

Japan's whaling industry has withdrawn its proposal that each Antarctic whaling fleet should reduce the number of catcher boats for next season, according to an industry spokesman in Tokyo. He gave the main reason for this as the rejection by the Norwegian whaling industry of the proposal and Norway setting itself a limit of 5,800 blue-whales units. British whaling firms had supported the proposal.

The spokesman added that the Japanese whaling industry was discussing its voluntary limit for next Antarctic season. The withdrawal of Japan's proposal should not be taken as indicating that Japan intends to increase the number of her catchers.

NEW RUSSIAN WHALING FLEET:

A new Russian whaling fleet will be operating in the Antarctic next whaling season, according to Russian press reports. These claim that the expedition's factoryship has "probably no equal" among foreign whaling vessels.

The Russians say the ship is equipped to make full use of byproducts, with several mechanized lines for processing raw materials, also a research Laboratory.



Argentina

FISHING INDUSTRY CONTINUES MODERNIZATION PROGRAM:

A Buenos Aires, Argentine, fishing company has announced a 100-million-peso (about US\$1,171,000 at rate of 85.35 pesos to US\$1) expansion and modernization program. The company has chartered the modern 695-ton Japanese trawler-freezership, Yoshino Maru. This vessel, with a Japanese crew of 50, was due in Mar del Plata in September. The vessel is expected to fish tuna and swordfish in the Atlantic about 200 miles offshore.

The catches will be processed and frozen aboard the Japanese vessel, and after landing will be distributed by refrigerated trucks from the company's plant in Mar del Plata. Eventually the company hopes to produce fish for export. (Canada Foreign Trade, September 12, 1959.)

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SHRIMP INDUSTRY TRENDS:

Argentina's landings of shrimp have shown no unusaual changes during the past few years. Landings of 1,535 metric tons jumped to 2,471 tons in 1956, but

Argentina (Contd.):

then in 1957 dropped back to 1,575 tons. For the first 11 months of 1958 only 1,096 tons were landed. However, since the height of the Argentine season occurs towards the end of the calendar year, it is assumed that when December data become available the landings for 1958 will be about the same as in 1957.

Although there has been no drastic change in the landings, exports show another picture. Exports of fresh and frozen shellfish (believed to be mostly shrimp) have risen manyfold since 1955. From a low of 2.8 metric tons in 1955, exports jumped to 45.6 tons in 1956 and 244.8 tons in 1957. In 1958 exports of 423.1 tons were almost double the amount exported in 1957. For the first three months of 1959 exports amounted to 89.3 tons.

When looking at the exports to the United States, it becomes evident that more and more Argentine exporters are concentrating on shipping shrimp to the United States. There were no exports of shrimp to the United States in 1955, but in 1956 a total of 10.2 tons were shipped. In 1957 exports to the United States rose to 145.2 tons and spurted to 414.5 tons in 1958. During the first three months of 1959, 89.3 tons were exported to the United States—100 percent of Argentine's exports of fresh and frozen shellfish.



Australia

FISHERIES CONSERVATION EXTENDED TO EXTRATERRITORIAL WATERS:

The Australian Government has taken action to protect spiny lobster (crayfish), an important dollar-earning export, and shark in extraterritorial waters. These are already protected in territorial waters by State legislation. The essential purpose of the new regulations is to conserve existing stocks. The regulations apply to Australian nationals only; no other nationals at present take spiny lobster or shark off Australia. The new regulations took effect from August 1, 1959.

Spiny Lobster: Australia exports about US\$5 million worth of spiny lobster tails to the United States annually and Commonwealth Fisheries officials hope that the conservation measures under-

taken will keep the catch stable. There is no hope of an increase in supplies from presently-known grounds, although a survey of the islands western of the Great Australian Bight may reveal new crayfish grounds.

The Commonwealth Government, under legislation passed in 1959, is able to provide in extraterritorial waters the same protection for female spiny lobster already provided by State legislation in territorial waters. A closed season for female spiny lobster has been established and the taking of berried ones has been prohibited.

School Shark: Australia's third most important fish (in terms of quantity caught) is shark, and is principally sold by "fish and chips" shops. The school shark is a particularly important source of fish for the Victoria market.

The latest proclamations by the Minister for Primary Industry have established a legal minimum length of 36 inches and a closed season during November in extraterritorial waters.

The news release announcing the conservation measures in extraterritorial waters pointed out that the <u>Commonwealth Gazette</u> of July 23, 1959, contains a number of notices issued under the Commonwealth Fisheries Act designed to protect school shark and crayfish stocks in extraterritorial waters.

One of the notices prohibits the taking in all proclaimed waters of female spiny lobster of any species having eggs or spawn attached, which means that the protection given to berried spiny lobster by the various States in territorial waters has now been extended to extraterritorial waters.

The other notice dealing with female spiny lobster provides for a closed season for females of the species Jasus lalandii from August 1 to November 30 in proclaimed waters off Victoria and Tasmania. This closed season would be extended next year to cover the period June 1 to November 30 to coincide with the closed season in Victorian and Tasmanian territorial waters.

Because of changes in the wording of the Act it was necessary to publish new notices covering: (1) a legal minimum length of 36 inches for school shark; (2) a closed season during November for school shark both in extraterritorial waters off New South Wales, Victoria, South Australia, and Tasmania; (3) a legal minimum length of $2\frac{1}{4}$ inches on the carapace for the spiny lobster Panulirus longipes in extraterritorial waters off Western Australia; (4) a closed season from September 1 to November 14 for the spiny lobster Panulirus longipes in extraterritorial waters in Western Australia between 30° S. latitude and 33° S. latitude.

These four notices continued the regulations at present in force without any alteration.

A notice has been included to provide a separate closed season from December 15 to January 31 for southern spiny lobster in the King Island area and the notice providing for a closed season in the whole Victorian Tasmanian area from September 1 to October 15 has been amended accordingly.

Australia (Contd.):

The notice covering a legal minimum of $4\frac{1}{4}$ inches on the carapace for southern spiny lobster in extraterritorial waters off Victoria and Tasmania has also been amended at the request of the Tasmanian Government to include prohibition of the cutting up or dismembering of spiny lobster on a boat.

The tenth notice, setting a closed season for the spiny lobster <u>Panulirus longipes</u> from August 16 to March 14 in the Abrolhos area, provides for a slight extension of the area to include the Turtle Dove Shoals.

* * * * *

LONG-LINE FOR DEEP-WATER SPECIES DEVELOPED:

The Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) has announced the perfection of a new method of catching deepwater 'trevally' (genus Caranx), a fish which weighs 15-40 pounds. Trevally are caught off the continental shelf at depths of more than 100 fathoms. After years of experimentation, CSIRO had perfected a method which involves attaching 25 hooks, spaced a fathom apart and baited with tuna or barracuda, along a line weighted down with a 70-pound weight, according to a September 4, 1959, dispatch from the United States Embassy in Canberra.

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SHRIMP LANDINGS AND EXPORTS:

Landings: Australia's landings of shrimp have shown a steady decline since fiscal year 1954/55 from 6,648,000 pounds to 4,687,000 pounds in fiscal year 1957/58. Most of the shrimp is landed in the states of New South Wales and Queensland.

Tal	Table 1 – Australia's Shrimp Landings by States, Fiscal Years 1953/54-1957/58							
Fiscal Year								
	(1,000 Lbs.)							
1957/58	1,520	20 `	3,000	147	4,687			
1956/57	2,386	_	2,500	189	5,075			
1955/56	3,672	1	2,400	75	6, 148			
1954/55	4,603							
1953/54	3,558	-	700	45	4,303			

Exports: Only a small percentage of the landings are exported, and the bulk of the exports are shipped to the United States. Most of the exports consist of frozen raw headless shrimp.

Table 2 - Australian Total Exports and Exports to the United States of Fresh and Frozen Shrimp, 1956/57 and 1957/581/							
Destination	Ra Heads-on	w Heads-off	Cooked	Total			
1957/58:		(Pounds)					
United States	_	170,050	143	170, 193			
Honolulu	2,050	94,300	-	96, 350			
Other	300	7,050	25,629	32,979			
Total	2,350	271,400	25,772	299,522			
1956/57:							
United States	-	128,885		128, 885			
Honolulu	-	83, 265	20, 190	103, 455			
Other		4, 193 7, 665 73, 179 85, 037					
Total	Total 4, 193 219, 815 93, 369 317, 377						
1/Excludes re-e	xports.						

Table 3 - Australian Exports of Fresh and Frozen Shrimp by States of Origin, 1956/57 and 1957/581/								
	New South	ew South Queensland Tasmania T						
		(Pou	nds)					
1957/58:			'					
Raw,								
heads-on	100	2,250	-	2,350				
Raw,		,						
heads-off	5, 100	266, 300	_	271,400				
Cooked	10,229	15,543	-	25,772				
Total	15,429	284,093	-	299,522				
1956/57:								
Raw,	1		1					
heads-on	2,747	1,446	-	4, 193				
Raw,								
heads-off		198, 270	-	219,815				
Cooked	27, 154	66,215	-	93,369				
Total	51,446	265,931	-	317, 377				

Note: Fiscal Year--July 1-June 30.

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TUNA LANDINGS BREAK RECORD:

Tuna fishing is booming in New South Wales and is on the upgrade in South Australia, the Australian Minister for Primary Industry announced on April 26, 1959. He was commenting on this season's (1958/59) record catch reported in the two states in which Australia's main tuna fisheries are based.

Landings of tuna at New South Wales and South Australia ports this season to April 22 totaled 2,369 metric tons—a new record. They were 68.5 percent above the two-State catch of 1,406 tons in 1957/58.

The New South Wales season closed about the end of February when the canneries at Eden and Narooma had received a combined total of 1,797 tons, double the previous season's total. The New South

Australia (Contd.):

Wales tuna landings were worth at least £80,000 (US\$180,000) ex-vessel.

In South Australia, the season's landings were 572 tons, or about 30 tons above 1958. There was still a possibility of additional landings in South Australia.

The present commercial-scale Australian tuna fisheries have expanded 25-fold in seven years, from a catch of 95 tons in 1951/52 to nearly 2,370 tons already this season.

Most of the tuna caught by Australian fishermen is used for canning and in recent years this fishery has become a useful earner of foreign exchange through exports of canned tuna to the United Kingdom and the United States.



Boliva

IMPORTS OF FISHERY PRODUCTS, 1958:

During 1958 Bolivia imported about 1.6 million pounds (valued at US\$269,402) of fishery products, of which, 82.3 percent consisted of canned sardines in tomato sauce. The only other important fishery product imported in 1958 was about 200,000 pounds of preserved or canned fish.

Boliva's Imports of Fishery Products, 1958								
Product	Kilos	Pounds	Value US\$					
Caviar and fish roe	54	119	51					
Anchovies (all types)	2, 186	4,818	1,754					
Dried fish	23,582	51,989	16,487					
Preserved fish	90,649	199,845	49,031					
Fresh and cured fish	21,637	47,700	3,784					
Canned sardines (tomato)	603,596	1,330,687	198, 118					
Fish paste	864	1,904	177					
Total	742,568	1,637,092	269,402					



British West Indies

GRENADA TUNA LANDINGS:

Grenada (one of the Windward Islands), British West Indies, fishermen catch from 50,000 to 70,000 pounds of tuna a year, mostly bluefin and yellow-

fin. The fish range from 100 to 150 pounds each.

Experiments with miniature long lines (20 hooks) are now being carried out and it is believed that landings of tuna could be quadrupled if the long-lining experiments are successful and if a ready market for the tuna can be developed. (West Indies Fisheries Bulletin, May/June 1959.)



Canada

HERRING OIL SHIPPED IN TANKER:

When the small Norwegian deep-sea tanker Nordgard slipped into her berth at Vancouver's LaPointe Pier late in March 1959 it marked the first time in the history of the British Columbia fishing industry that a tanker had been chartered to load herring oil. Up until now, herring oil was shipped overseas in the deep tanks of cargo freighters.

After the Nordgard had her tanks, pipes, and pumps surveyed to ensure they were in spotless condition, the 3,800 long tons of herring oil, the equivalent of 140 railway tank cars and worth over C\$500,000, was loaded by two different methods. Approximately 1,800 long tons were pumped at full capacity of 60 tons per hour from the dockside storage tanks into the tanker. The remaining 2,000 long tons were transported from tank storage facilities at Steveston, B. C., some 25 miles, by a small coastal tanker then pumped aboard the Nordgard. The oil was consigned to Manchester, England, for use in the processing of margarine and cooking oils. (Trade News, April 1959.)

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PLANS FOR NEW OCEANOGRAPHIC INSTITUTE ANNOUNCED:

A member of the Canadian Parliment from Nova Scotia in a statement published in a Halifax newspaper on August 4, 1959, outlined plans for a greatly expanded program of oceanographic research. His statement follows:

"Canada, which possesses the longest coastline of any country in the world, is

taking steps to expand oceanograpy in the Department of Mines and Technical Surveys to fill the gaping need for oceanographic data on its coastal waters for defense and research assessment purposes.

"It is setting up on the east coast, in Bedford Basin near Halifax, a C\$3 million oceanographic institute, which will have the facilities to allow studies in any phase of the science. The new institute will take five years to complete and, when in operation, will have a staff of some 300 oceanographers, hydrographers, submarine geologists and other scientific personnel, plus supporting staff, and an operating fleet of oceanographic vessels.

"A multi-million dollar ship-building program has already been set under way to provide the fleet of oceanographic vessels. The first of these vessels, the \$7 million C.G.S. Hudson, is expected to be commissioned in 1961.

"The establishment of the institute which is to be known as the Bedford Institute of Oceanography, is announced today, on the eve of Dartmouth Natal Day.

"Specifically, the new institute will turn an oceanographic spotlight on Canada's Atlantic and sub-Arctic coasts to study the physical characteristics of the waters and underlying seabed. The resultant data is needed for anti-submarine defenses to ascertain the resources potential of the country's continental shelf in these regions and to assist navigation.

"It will also permit the overdue expansion of the Atlantic and sub-Arctic sections of the Canadian Hydrographic Service. These sections will be moved from Ottawa to Bedford Basin, which will greatly facilitate hydrographic operations in eastern and northern areas. In addition, it will house the regional office of the Geological Survey of Canada.

"The whole project will mean the building up, near Dartmouth, of a strong centre of marine science. It includes liaison with the Fisheries Research Board, the Atlantic Oceanographic Group,

which will be housed in the new institute, and with Dalhousie University which is setting up--with the help of a National Research Council grant--an Institute of Oceanography for the training of scientists, many of who will be employed by the new Federal Institute. It will also be the headquarters of the polar group of oceanographers, hydrographers, geologists and other scientists, working in the icebound sections of the far Arctic. They will carry out a broad program of oceanographic research on the rim of the Arctic Basin.

"Canada posseses little knowledge of the oceans which surround it. Except for a specialized program in oceanography by the Fisheries Research Board over the years, oceanography in Canada has been a neglected science, mainly because of the size of the job to be done and the great expense entailed in doing it.

"Today, however, the knowledge derived from oceanographic research is vitally needed by government and industry for purposes of defense, commerce and science. In the face of the growing danger of ballistic missile-carrying submarines, a detailed knowledge of the characteristics of the water and of the sea bed is necessary for the development and operation of adequate instruments of detection.

"Knowledge gained from oceanography is required, too, to ascertain the resource potential of the country's continental shelves. This is especially important today because of the conclusions arrived at by the Geneva Convention of 1958 that the resources of the continental shelves belong to the adjacent nation. On the east coast, Canada's continental shelf extends 100 to 200 miles out into the Atlantic Ocean.

"An extensive program of work is envisaged in the new project. Oceanographers and hydrographers will study and map the topography of the ocean floor and measure the movements, temperature, density and chemical properties of the water at various depths.

"They will study the separate and distinct layers of water of which the oceans are comprised, and each of which has its own characteristics. Modern methods of submarine detection depend on the transmission of sound in water,

which requires a detailed knowledge of these characteristics.

"Geologists will study bottom sediments and cores taken from the ocean floor. Such studies will yield valuable data on the life of the earth's crust, changes in climate, vegetation, volcanic activity, etc; enable geologists to recreate the history of mountainous formations on land because, in the depths of the ocean, the temperature remains practically unchanged, there is no erosion and little movement of water; and reveal possible mineral resource wealth on the shelf.

"Geophysicists will use magnetometers, gravimeters, and seismic equipment to diagnose the structures underlying the floor.

"The new institute will be a combined laboratory and office building, with separate depots, shops and storage facilities. The scientific personnel will carry out investigations and research in modernly equipped laboratories. It will provide all needed store facilities for its fleet in the way of docking and berthing facilities, and routine repair and maintenance services. The institute is so planned, moreover, to permit the expansion of these facilities, if needed, to meet the requirements of a growing fleet

"The heart of the new project will lie of course in its fleet of oceanographic and hydrographic ships. The shipbuilding program will add additional ships until the requirements are met for new ships and for the replacement of old and chartered ones now in use by the Canadian Hydrographic Service. The new C. G. S. Hudson and all new vessels will be combined oceanographic and hydrographic ships, equipped with laboratory and other facilities for survey and research work. They will be capable of working in any season of the year, while the larger ships, like the Hudson could work anywhere in the world. All vessels will be strengthened for work in the Arctic.

"The expansion in the charting activities of the department's Canadian Hydrographic Service is long overdue. Many factors, including defense needs,

the entry of Newfoundland into Confederation, and resource development and exploratory and other activity in the Arctic, have greatly increased demand for charts and information on the coastline and waters involved.

"Since its establishment in 1883, the service has been operating on a scale far out of proportion to the size of the task to be done. Canada possesses some 120,000 miles of coastline. The greater part of this coastline, much of which is extremely complex and shoal-studded, has not yet been charted. The uncharted areas include almost all of the arctic archipelago, the northern mainland coast, Hudson Bay, and the Labrador coast.

"As a start on the expansion of its hydrographic activities, the department has added the chartered ship, M/V Theta, to its fleet. It is carrying out tidal, current, and oceanographic surveys in Cabot and Hudson Straits. Included in the fleet are the C.G.S. Baffin which is charting in Hudson Strait; the C.G.S. Kapuskasing which is sounding off the east coast of Newfoundland; the C.G.S. Cartier, engaged in charting work in the region of Cape Bald and Chaleur Bay in New Brunswick; and the C.G.S. Acadia which is doing similar work on the northeast coast of Prince Edward Island. By 1960 the service hopes to add . . . two additional ships for oceanographic work, and by 1962 the first ship under the new program, C.G.S. Hudson, will be added to the fleet.

"In setting up the Bedford Institute of Oceanography, Canada is taking cognizance of the importance of the fast-growing science of oceanography and of the value of the contribution it can make in the unravelling of the scientific mysteries of the country's last frontiers—its coastal waves."

* * * * *

SURGE IN FISHING BOAT CONSTRUCTION:

In the Canadian Maritime Provinces this past spring boat builders reported the heaviest program of fishing boat construction in the postwar period.

Construction was in progress of scores of fishing craft ranging from draggers to small lobster fishing boats. So busy are

small lobster fishing boats. So busy are some of the yards that many fishermen have had to wait weeks before their orders could reach the cradle stage. While most of the larger craft--draggers, long-liners, and some of the larger Cape Island-type craft--are financed by fishermen's loan boards in the three Maritime Provinces, some of the smaller ones are financed by fishermen themselves.

This upswing in boat-building is general throughout the three provinces. New Brunswick reports the greatest fishing craft building boom in its history, while Prince Edward Island and Nova Scotia also report heavy activity along that line.

In the Caraquet-Shippegan area of northern New Brunswick, for instance, there are six 65-foot Gloucester-type draggers being built in addition to four long-liners and nearly 20 lobster boats in the 25-foot class. Two of the draggers will be operated in the Bay of Fundy area, while four will join the Shippegan fleet.

The Port Elgin district in eastern New Brunswick reports nearly 50 lobster boats building ranging in length from 40 to 44 feet. Two small draggers are being built at Black's Harbor, N. B.

Boat-building in Nova Scotia is keeping pace with its sister province. The major boat-building centers are reported working full tilt to keep up with orders. Two long-liners and several boats of the Cape Island class are being built at Lunenburg and there is also boat construction at Port Greville. At the latter place two draggers are being built for the Souris fleet in Prince Edward Island.

In the Yarmouth area two Cape Islandtype boats have been built since the first of the year and two more are under construction. Reports from Wedgeport-Pubnico show that nine Cape Island boats are being built there in addition to one long-liner. Until the current boat-building program is completed, final figures on the growth of the fishing fleets in 1959 will not be available. However, a glance at last year's figures shows an almost phenomenal growth in the postwar period. Last year the more than 26,000 fisherment reaped a sea harvest representing about C\$35,000,000 in landed value.

Not counting the thousands of small boats engaged in the lobster fishery and other types of inshore fishing, there were more than 500 trawlers, draggers, long-liners, dory schooners, and sword-fish boats operating out of Maritime ports in 1958.

Nova Scotia tops the list in all classes of boats. Last year that province had a dragger fleet of 163 vessels, while 99 draggers operated out of New Brunswick ports. Prince Edward Island had 13 draggers, all operating out of Souris. A dragger might be classified as a vessel of 100 feet or less in length which uses otter-trawl nets. There are, of course, vessels of the dragger-type fishing scallops and herring and using other types of gear.

The only large trawler fleet in the Maritimes operates out of the main ports in Nova Scotia. In 1958 it numbered 34 vessels, each ranging in length from 153 feet to 103 feet. Nova Scotia trawlers vary in tonnage from 399 to 132 tons.

The long-lining fleet in Nova Scotia included 85 vessels in the 26- to 50-ton bracket; 55 long-liners with tonnages from 51 to 150 tons and three vessels of that type over 150 tons.

Of the once-mighty fleet of schooners sailing out of Nova Scotia fishing ports to the fishing banks, in the North Atlantic, there are only 8 dory schooners left. Most of them sail out of Riverport.

There were 16 scallop draggers registered in Nova Scotia last year. Heaviest scallop landings last year were at Lunenburg. Bulk of the catch was taken from Georges Banks.

About 14 purse-seiners fish herring in the Bay of Fundy. Most of them are

of New Brunswick registry. In addition, there are 11 herring carriers which take the catches from the seiners at sea.

Nova Scotia has a fleet of swordfish boats. Yarmouth has become one of the major swordfish ports, and seven of the boats are owned there. During the swordfish season, which gets under way in June, a good portion of the long-liner fleet also engages in that type of fishing. (Trade News of the Canadian Department of Fisheries, April 1959.)

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TRANSFER OF DISEASE-RESISTANT OYSTERS ON EAST COAST

IN FINAL PHASE:

"Operation Oyster" is in its final phase. This three-year project, sponsored by the Department of Fisheries of Canada, provided for the transfer of 10,000 barrels of disease-resistant Prince Edward Island oysters to rehabilitate stocks in New Brunswick and Nova Scotia.

The motor vessel Lamna, flagship of the Department's 30-boat patrol fleet in the Maritimes, conducted the transfer of the final 4,000 barrels to beds in the two mainland provinces. Assisting the Lamna were four other boats.

This final phase of the project called for the transplanting of oysters in specific areas in the Northumberland Strait extending from Pictou County in Nova Scotia to the Shippegan-Caraquet districts in northern New Brunswick.

A quantity is being held in reserve for seeding beds at Miscou in the same general area later if disease spreads to those waters. Results of the transplant program have been described as a singular success.

Depletion of the stocks in the two mainland provinces created a crisis in the once-profitable oyster industry. Production slumped drastically. In 1957 only 9,000 barrels were fished in the two provinces. In 1958 the production was less than half that amount. Normal production is around 30,000 barrels. Prince

Edward Island's production in 1958 brought the fishermen C\$263,000, an increase of \$108,000 over the previous year. The devastation of mainland beds was similar to that which destroyed Prince Edward Island's beds in two epidemics from 1915-1920 and 1935-1940. Oysters which survived the heavy mortality are resistant to the disease (harmless to humans) and that is why they are being used to rehabilitate mainland stocks.

History of the present oyster crisis goes back to 1950. In that year heavy mortalities hit the oyster stocks in Kent County and later the mortalities spread throughout New Brunswick and into Nova Scotia. In 1952 there were nearly 8 million pounds of oysters harvested from Maritime oyster beds. Then for six years there was a sharp decline in New Brunswick and Nova Scotia until the production had been reduced by nearly twothirds.

Early restoration of the commercial oyster fishery is promising if the oysters encounter favorable years for reproduction. With luck most fisheries should be producing again in 1965. (Canadian Trade News of June 1959.)

Note: Also see Commercial Fisheries Review, Dec. 1958, p. 65, Jan. 1958, p. 78.



Ceylon

U. S. S. R. BETTERS JAPANESE FISHERY AID PLAN TO CEYLON:

The realization of Japan's plan for economic aid in the development of Ceylonese fisheries is endangered by the Soviet Union's offering a similar plan on more advantageous conditions. The Japanese Government some time ago decided to give economic aid for the development of Ceylon's fishing industry through a \$4 million deferred payment loan from the Export-Import Bank. Now it is reported by authorities concerned that the Soviet Union is approaching Ceylonese authorities with a similar plan but involving a loan of \$30 million to be repaid over a 12-year period with interest at 2.5 percent.

Since the Japanese Import-Export Bank loan which the Ministry of Agri-

Ceylon (Contd.):

culture and Forestry had been pushing was for a smaller amount, the Ceylonese have not shown much interest in it. The Japanese plan had also run into much domestic opposition because it involved the supplying of tuna fishing boats to Ceylon. Under the circumstances, the Ceylonese may break off negotiations with Japan and accept the Soviet proposition. (Suisan Keizai Shimbun, August 6, 1959.)



Colombia

CANNERY ARRANGES FOR DIRECT DELIVERIES OF JAPANESE TUNA:

A Colombia packing plant, located in Barranquilla, announced early in September that it has made arrangements with the Japanese fishing vessel Seiun Maru to deliver a considerable quantity of frozen tuna. The Japanese vessel, which has been fishing in Colombia waters for some time, has refrigerated space for 250 tons of fish and the first consignment to Barranquilla is for 40 tons.

The packing plant plans to can the tuna to help meet the Colombian demand for fish.

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JAPANESE TUNA VESSEL LANDS TRIP FOR FISH CANNERS:

On August 31, the 230-ton Japanese tuna fishing vessel Seiun Maru docked in Barranquilla with about 50 tons of tuna caught on the high seas off Jamaica. The Seiun Maru has a 33-man fishing crew in its complement. The ship is working under a purchase agreement with a Barranquilla cannery. In addition, part of the catch was expected to be purchased by two other canneries on the north coast of Colombia, one in the town of Cienaga, Department of Magdalena, and the other in the city of Santa Marta, which is near Barranquilla. (United States Consulate report, Barranquilla, August 31, 1959.)

Cuba

CLOSED SEASONS ON CERTAIN FISH ENDED:

The Cuban National Fisheries Institute of the Cuban Maritime Development Agency announced the end of the closed season originally imposed on April 1, 1959, on the capture of mojarras (perch), jotoru, biajaca (tripletail), and dajao, effective July 25, 1959. The order was published in the Official Gazette No. 135 of July 25, 1959. Also in the same issue was published a Resolution ending the closed season originally imposed on April 5, 1959, on the capture of biajaiba (lane snapper), effective August 15, 1959. A later resolution published in the Offical Gazette No. 144 revised the effective date to August 8, 1959.

A Resolution revoking the closed season on the capture of sponges, originally imposed on May 5, 1959, north of Caibarien and south of Batabano was published in the Official Gazette No. 143 of August 5, 1959, effective August 15, 1959. (United States Embassy report, Habana, August 18, 1959.)

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CLOSED SEASON FOR OYSTERS ENDED:

The National Fisheries Institute of the Cuban Maritime Development Agency terminated the closed season on the capture of oysters effective September 14, 1959. The closed season on oysters was originally imposed on June 10, 1959.

A Resolution announcing the above termination was published in the Official Gazette No. 166 of September 4, 1959. (United States Embassy report, Habana, September 10, 1959.)

* * * * *

CLOSED SEASON FOR SNAPPER AND MORO CRAB:

The Cuban National Fisheries Institute (Instituto Nacional de la Pesca) of the Cuban Maritime Development Agency (Fomento Maritime Cubano) announced a closed season on Cuban snapper (cubera), grey snapper (caballerote), and Moro crab for the period beginning August 1, 1959, and ending October 24, 1959. Ac-

Cuba (Contd.):

cording to the Cuban General Law in Fishing a closed season of 84 lunar days is established for those species of fish and shellfish that require such protection during their spawning season. The above closed season, apparently setting a new trend in that both beginning and termination dates are shown, was published as a resolution in the Official Gazette No. 139 of July 29, 1959. (United States Embassy report, Habana, August 24, 1959.)

* * * * *

QUOTA FOR 1959 CANNED BONITO IMPORTS:

The Cuban Minister of National Economy in a Resolution published in the Official Gazette No. 126 of July 10, 1959, fixed a maximum total import quota of 1,010,200 pounds of canned bonito which may be brought in by Cuban importers during 1959.

The stated reason for the quota appears to be an attempt to keep imports of canned bonito within reasonable limits pending the implementation of the new Cuban customs tariff reforms.

It is interesting to note that imports of canned bonito as reported by the Cuban National Fisheries Institute (Instituto Nacional de la Pesca) for 1958, however, only amounted to 805,530 pounds which is considerably under the 1959 quota. Approximately two-thirds of all Cuban bonito imports normally originate from Spain.

Eighty percent of the 1959 quota is reserved for regular commercial importers of canned bonito who were engaged in that line during the three-year period 1955-57. The remaining 20 percent of the quota is allotted to occasional bonito importers who have been engaged in that line during the first five months of 1959. Importers who exceed their self-declared quota may sell or assign such imported bonito to other importers who still have an unfilled quota. (United States Embassy report from Habana, August 4, 1959.)

Egypt

FIRM EXPANDS FACILITIES FOR FREEZING SHRIMP:

A company established in mid-1957 for the canning of fruits and vegetables at Siouf, Egypt, during 1958 processed and froze a sizable quantity of shrimp for Alexandria exporters. This cannery, which is controlled by the Egyptian Government Economic Organization and in which an American Company has a minority interest, hopes to enter the frozen shrimp export business in 1960.

The company's cannery has recently rebuilt and expanded its freezing facilities at a cost of about \$40,000 and will be ready for operation by the beginning of the new shrimp season in November 1959. The new facilities, housed in a separate building, consist of shrimpholding space (15 tons at about 34° F.-41° F.), cleaning and grading areas, and frozen storage space (60 tons at about -40 F.), in addition to the contact freezing units themselves. All of this equipment is of United States manufacture. This expansion will quadruple previous capacity. In order to take advantage of this facility, however, it will be almost essential to obtain the services of a well-trained expert in the shrimp freezing business. (United States Consulate report from Alexandria, September 2, 1959.)

* * * * *

JAPANESE FISHERY PLANTS RECEIVED:

Egypt received in mid-August 1959 four plants from Japan in accordance with an agreement signed in November 1958 under the \$30.0 million Japanese industrialization loan to Egypt.

The plants, which were unloaded in Cairo, are for manufacturing fishing nets, cans for preserving fruit, shrimp freezing and preservation, and fish packing.



France

NEW TYPE TUNA-TRAWLER VESSEL SUCCESSFUL:

For some months this year two dual-purpose vessels of a new type have been fishing for French owners. The new class could be described as trawler-tuna boats, and they have already proved them selves capable of carrying out either form of fishing with equal efficiency.

The two vessels in question are the $\underline{Cote}\ \underline{d}'\ \underline{Argent}$ and the $\underline{Simone}\ \ \underline{Valentine}.$

The principal particulars are: length over-all 91 ft. 10 in.; length between perpendiculars 78 ft. 9 in.; breadth 22 ft. 8 in.; depth 12 ft. 1 in.; refrigerated fish hold capacity 2,825 cu. ft.; fish well capacity 1,413 cu. ft.; fuel capacity 9,250 gallons.

Both vessels have a gross tonnage of 250 tons, and are built to the highest Bureau Veritas standards in their class.

While a number of tuna boats habitually practice trawling also, this is the firsttime that a basic design has been evolved for dual-purpose fishing of this type, and their form has been somewhat influenced by that of the United States tuna clipper. The reason for this new departure lies in the limited period during which tuna fishing can be practiced off the French and Spanish coasts, namely from May to October. While the fishing still continues off the African coast, this presents certain problems of marketing, and of preservation and transportation in medium tonnages. The decision was therefore taken by the owners, to build vessels that could engage in live-bait fishing in season, and afterwards turn to trawling or sardine fishing. Although there were some misgivings at first as to sea-keeping qualities and crew-accommodation problems, the results of some two years' research was reassuring, and the decision was taken to build.

The vessels are of all-welded steel construction, zinc-sprayed where necessary, and are flush-decked, except for the forecastle, which is slightly raised to accommodate twelve 3-tier bunks for the crew, the number of which varies according to the type of fishing in progress. Access to the crew's quarters is by a passageway below deck, opening on to the superstructure. Leading off this passageway is the mess room, galley and cook's quarters, and access to the engineroom, though in fine weather this is entered from the deck.

The engineroom is well forward, and houses main engines, auxiliaries, and refrigeration plant. The main engine of the Cote d'Argent is a V-8, developing 400 hp. at 1,250 r.p.m., and driving through an oil-operated reverse reduction gear of 4:1 ratio. The Simone Valentine is powered by V-12 type 12 v. 18/22, and this develops 450 hp. at 1,000 r.p.m., driving through a oil-operated gearbox having 3:1 reduction ratio. Both normally are bridge-controlled.

The intermediate shafts in both vessels are supported on roller bearings and pass beneath the refrigerated spaces in an insulated tunnel.

Auxiliary engines are in both cases two developing 50 hp. at 1,200 r.p.m. coupled to gearboxes through which the pumps, generators, and refrigerating units can be driven, and which, coupled together by a shaft, drive the hydraulic pump for the trawl winch. In the event of main-engine failure the auxiliaries can be coupled to the propeller shaft and a speed of 5 knots can be achieved. The auxiliaries to be driven include 2 pumps for circulating water in the bait tanks, each of 150 tons per hour capacity; 2 refrigeration units, a general service pump, an exhaust pump, and a 2-1/2 kw. and 6 kw. generator.

Aft of the engineroom are the live-bait tanks, two on each side of the vessel, separated by a refrigerated compartment, which in turn gives access to the cold-storage room. Right aft is a large storage room. Fuel is stored in double-bottom tanks and in 4 lateral tanks.

All the living quarters are insulated and the floors are rubber-covered.

The refrigerated compartments of the \underline{Cote} $\underline{d'Argent}$ are cooled by cold-air circulation, and those of the \underline{Simone} Valenting by pipes around the chambers. High and low-temperature safety controls are fitted, and temperature control is to within 1/2 a degree approx., the minimum temperature being in the region of $5^{\circ}F$.



The trawler-tunny boat Cote d' Argent.

The bait tanks are of steel sheet, the interiors being zinc coated. Sea water for the conservation of live bait is circulated from the tank bottom. They are insulated with thick cork, as they are also capable of being cooled to below freezing point by immersed refrigerating coils, to serve as cold storage, refrigerated brine tanks, or quick freezers.

The steering gear favored for these vessels is their reversible-direct hydraulic type, in preference to rod and chain.

The trawl winch also is hydraulically-operated and is fitted aft of the superstructure. Other deck features include small bait tanks and the usual gunwale ramp for tuna fishing, both to starboard. Detachable gallows are fitted on either side.

A laminated unsinkable ship's lifeboat is provided, and two inflatable liferafts are mounted on the bridge, where navigational equipment includes an echo-sounder, fish-finder, navigator, and radiotelephone.

Both vessels have fished profitably from French and Spanish ports in depths approaching 200 fathoms, and the owners are satisfied with their new venture.



German Democratic Republic

EAST GERMANY BUILDS MORE FISHING VESSELS:

Under the new seven-year plan for East Germany, its shipyards in Rostock, Warnemunde, Wismar, and Stralsund will build over 500 freighters, passenger vessels, and fishing craft, according to a report in Dansk Fiskeritidende (July 17, 1959), a Danish fishery trade paper. Sixty-seven of these will be fishing vessels designed for fishing in distant waters in the South Atlantic. Each of these distant-water vessels will measure 2,900 tons and be built in Stralsund.



German Federal Republic

NEW FISHERY RESEARCH INSTITUTE:

A new research institute for fishery economics and fishery policies has been registered in Bremen, according to a reGerman Federal Republic (Contd.):

port in <u>Dansk Fiskeritidende</u> (July 10, 1959), a Danish fishery trade paper. Its Director is Dr. Wilhelm Blanke who also is head of the State's research office for fisheries of the Commission for Economic Research in Bremen.

The new institute has been formed to investigate fishery economic and fishery policy problems on a scientific basis. It is the first of its kind both in Western and Eastern Europe. As a more flexible organization than the research office, it will supplement the latter's work, which because of its character as a State organization works too slowly to be able to make prompt decisions and regulations. The institute hopes to have all the trawler companies as well as other fishery industries as its members. The first problem will be to clarify the economic basis for the use of new fishery areas in the North Atlantic.



Ghana

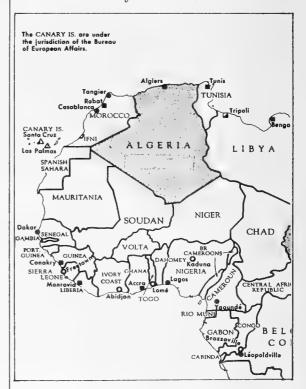
UNITED STATES PACKING COMPANY SIGNS AGREEMENT TO MAKE TUNA SURVEY:

The Minister for Economic Affairs of Ghana, who is also the Minister responsible for Commerce and Industry, on behalf of the Ghana Government, signed an agreement late in August with a United States west coast tuna-packing company.

The company will carry out, in conjunction with the Ghana Fisheries Department, a survey to determine:

- (1) The most effective method of capturing the available tuna and other pelagic fish, and the type of vessels best suited for the work.
- (2) The feasibility of the project and economic studies relative to the establishment of a tuna-freezing and canning industry at Tema.
- (3) The abundance and availability of tuna within a thousand-mile range of Tema.

- (4) The abundance and availability of tuna bait along the coast of Ghana.
- (5) The availability of other shoal fish susceptible of being processed at Tema.
- (6) The feasibility and economic studies relative to the establishment of a wet-fish industry at Tema.



The survey, which is being financed jointly by the Ghana Government and a United States firm, will prove the feasibility of establishing a deep-sea fishing industry based at Tema with shore establishments for canning, freezing, and the manufacture of fish meal. (Ghana Times, August 31, 1959.)



Iceland

SUMMER HERRING LANDINGS LARGEST SINCE 1946:

Iceland's herring catch off the north and east coasts has assumed unexpectedly large proportions in 1959--the largest summer herring catch since 1946 or

Iceland (Contd.):

1947. Record landings of 135,000 metric tons of herring were reported as of August 24, 1959, as compared to 62,000 tons at the same time in 1958. By the end of August 1957 it was expected that the boats would commence on the south coast herring fishery with drift nets.



An Icelandic fisherman.

The catch was of high fat content. Salting continued briskly after a 6-day pause until the Soviets took an additional 40,000 barrels. Salting towards the end of August slowed down as orders were filled.

Iceland's Summer Herring Landings and							
Utilization to August 15							
1959 1958							
	.(Metric Tons).						
<u>Used</u> for:		l					
Salting	27,163	38,747					
Reduction	98,631	26,742					
Freezing	1,743 1,275						
Total	127,537	66,764					

A local newspaper estimated the export value of the north coast catch at

Ikr. 72.4 million (US\$4.4 million) for the salted and Ikr. 112.5 million (US\$6.9 million) for the oil and meal, or a total of Ikr. 184.9 million (US\$11.3 million). The same paper states the vessels were paid Ikr. 19.9 million (US\$1.2 million) for the herring catch.

Herring used for salting purposes amounted to 201,204 barrels (298 pounds a barrel) as of August 15 and actual export commitments to that date were about 190,000 barrels (220 pounds a barrel). Therefore, they are roughly in balance. Contracts for north coast herring, which are now largely filled, come to 80,000 barrels to the U. S. S. R., 50,000 barrels to Finland, and 60,000 barrels to Sweden. This compares with advance contracts last year for salted herring amounting to 300,000 barrels (north and south coast). Negotiations were in progress for the sale of up to 8,000 barrels of salted herring to the United States from the north coast catch.

As for the south coast catch, only 40,000 barrels of salted herring have been signed for by the Soviet Union in advance, compared with 110,000 barrels sold last year. Trade agreements with East Germany and Poland call for 15,000 barrels and 20,000 barrels, respectively, of the south coast catch, but these amounts have not been contracted for as yet.

Meanwhile the relatively low prices prevailing for oil and meal was causing some concern to the reduction plants. According to the press, the Executive Manager of the State Herring Factories remarked that he hoped the sale of those products would be good in the fall, but that very little herring oil or meal has been sold so far. He added that 1.000 metric tons of meal have been sold to Iceland's chief fish meal market, Great Britain, but that the usually good West German market has been fully loaded with meal from Peru, Holland, and Denmark; sales of fish oil to Germany have been proceeding fairly well; however, some optimism prevailed that meal prices would rise this fall.

The manager of an oil and meal plant on August 13 said his plant had produced about 4,800 metric tons of meal and 1,000 metric tons of oil in 1958 with an export value of nearly \$1 million (including the Iceland (Contd.):

55-percent subsidy), but that he had on hand over 2,000 metric tons of fish meal undisposed of due to the low prevailing prices. He had sold his fish oil in advance to Norway at £72 10s. a metric ton (better than 9 U.S. cents a pound), but quoted August 1959 prices at about £62 a ton (less than 8 cents a pound).

Contracts for north and south coast salted herring to date therefore amount to 230,000 barrels, compared with 300,000 barrels contracted (288,000 filled) for last year. The herring salters made advance arrangements this year to salt 300,000 barrels. (United States Embassy report from Reykjavik, Aug. 20, 1959.)

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PLANS FOR TWO FISH CANNERIES UNDER STUDY:

The Federation of Iceland Cooperative Societies (whose members are responsible for 20 percent of the country's fish exports and all its agricultural exports) with the aid of Swedish engineers is completing studies for the erection of two canneries in Iceland. One would be built in or near Reykjavik to pack both fish and meat products and would cost about US\$800,000. Another plant is planned for Akureyri to process fish products only and would cost about \$200,000. Of this \$1 million projected cost it is expected that the Federation of Swedish Cooperatives will provide about \$800,000 in the form of a loan.

The Swedish Federation would export various products from its member cooperatives, which would be sold through the Icelandic Federation's cooperative retail outlets. The "counterpart" from these sales would help generate local currency for the construction of the canneries. Other segments of the Swedish loan would take the form of shipments of Swedish machinery, or, as necessary, advances of certain third country currencies for other foreign machinery purchases.

The fish products which the Icelandic Federation could pack in these plants, particularly if there is a demand in the United States and other free currency areas for them, are: herring intomato or mustard sauce or natural style; sardines in oil

or tomato sauce; fish balls; gaffelbiter (spiced herring in vinegar); spiced herring fillets; shrimp; and small lobster. Total annual fish canning capacity for the two plants is estimated at about 1,500 metric tons.

The smaller-scale meat canning would take the form of lamb in "Irish stew," and mutton and whale meat for pet food.

The Iceland Federation is anxious to increase its export sales in the United States and western Europe. In 1958 it exported fish products worth 143.4 million kronur (about US\$8.8 million), of which 56.8 percent went to the dollar and western Europe areas, as compared with 45.5 percent in 1957. (United States Embassy report from Reykjavik, Sept. 9, 1959.)

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THREE NEW SHRIMP PROCESSING PLANTS BEING COMPLETED:

Three new shrimp-processing plants are being completed on the northwest coast of Iceland, two of which will shortly receive new shrimp-peeling machines from the United States. The shrimp catch has been good despite unfavorable weather conditions.

The shrimp, which is largely canned, goes to Great Britain. That which is frozen is shipped to the United States. This expansion is a further step towards further specializing in preparation of sea foods, the United States Embassy in Reykjavik reported on August 27, 1959.



India

SMALL MODEL FISH-MEAL PLANT DEVELOPED:

A demonstration of a small model fish-meal plant, developed by a United States-educated fisheries engineer, was held late in June 1959 at a fisheries plant in Bandra, Bombay, India. The plant was designed and built by the fisheries engineer with the help of an expert on boilers, for the manufacture of fish meal from nonfood fish and fish waste. The demonstration was attended by the Bombay Director of Fisheries, members of the Bombay Fish Meal Exporters' Associa-

India (Contd.):

tion, Japanese fisheries experts, and local fishermen.

The Director of Fisheries remarked: "I was very happy to see a small model of a fish meal plant made locally. This is an important and valuable step in the fish meal industry."

Fish meal is exported and is a source of considerable foreign exchange to India. Fish meal has been manufactured locally by sun-drying the fish on concrete floors, which is a laborious process, requiring some two to three days to complete the process, depending on weather conditions. In addition, the final product contained a large amount of sand, and the protein content was never higher than 50 percent.

This fish-meal plant is the first of its kind in India and is built entirely to suit local conditions. It requires no power and it consists of a double-jacketed dryer, a superheater, boiler and furnace, all built as one compact unit. The unique feature of this plant is that it can be operated on any fuel available, hence suitable for any part of the country, even when installed on fishing boats. The cost of operation is as low as Rs. 15 (about US\$3.15) per ton of fresh fish, and requires only one man to operate it. It is so built that it does not come under the regular Boiler Act, hence it needs no registration. Each unit can handle some 5,000 pounds of raw fish per 24 hours, and the unit is expected to cost about Rs. 6,000 (about US\$1,270).



Indo nesia

FISHERIES--A MAJOR INDUSTRY:

The Union of Indonesian Fisheries Cooperatives (GKPI) has announced that, according to data compiled by the Union, there are now about 400,000 fishermen in Indonesia. The fishermen operate 950 motor fishing vessels, and about 110,000 sailing craft of various sizes, the United States Embassy in Djakarta reported on September 14, 1959.



Fishing in Jakartaharbor, Indonesia.



Japan

ATLANTIC TUNA FISHERY:

The assistant chief of the fishing department of a large Japanese company returned to Japan on July 22, 1959, completing a full year of observations of the Atlantic tuna fishery bases at Haiti and Trinidad and tuna industry centers such as Ponce, Puerto Rico, and New Orleans, United States. He had the following to say about conditions in those areas:

Haiti is unsuitable as a tuna fishing base because of the lack of port facilities for fishing boats. After only 12 trips out of Haiti, the base was shifted to Trinidad. Trinidad is a shipping and distribution center linking North and South America and Europe, and has port facilities commensurate with the 10 or 11 ships of the 10,000-ton class that daily enter or leave the port. Petroleum resources are abundant, and fueling is easy.

As for the problem of the recently increasing claims against tuna exported from the Atlantic fishery to the United States, it looks as if the tuna taken off the Gold Coast from April to June are liable to have "green meat" or dark meat because they are in post-spawning condition. This official had personally examined tuna against which claims had been made at the cannery in

Ponce, and found that they were off-color, had off-odors, and were definitely substandard.

Two 150-ton United States boats were fishing in the Gulf of Mexico out of New Orleans. There, too, 20 percent of the fish taken in September and October was unsuitable for packing because of off-colors. He found it interesting that those boats were using Cremona line imported from Japan and operating in the same way as Japanese long-liners. (Nikkan Suisan Tsushin, August 4, 1959.)

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ATLANTIC TUNA FISHERY TRANSSHIPMENTS TO U.S. DROP SHARPLY:

A quota for this year of 120 trips was set for Japanese tuna fishing operations in the Atlantic for transshipment to the United States, but because of the large cannery claims against fish produced in May and June, the operator's interest in selling to the United States market has faded considerably. At the same time, Italy, Yugoslavia, France, and other European markets have welcomed Japanese tuna far above expectations, and vessels which were sent to the Atlantic with the primary object of exporting their catch to the United States are turning to direct exporting to Europe. As a result, it is anticipated that probably only about half of the quota of 120 trips will be used up.

Performance and plans for the first half of the export year, from April to September, show only 30 trips for export to the United States and 41 trips for European markets. (Nikkan Suisan Tsushin, August 17, 1959.)

Plans for Japanese Atlantic Tuna Fishery Transshipments, April-September 1959								
Month U.S. Italy				ly	Yugos	slavia	Oth Europ	
	Shorts		Short		Short		Short	
	Tons	Trips	Tons	Trips	Tons	Trips	Tons	Trips
April	1,039	4	760	2	977	3	-	-
May	3,397	9	595	2	-	_	-	-
June	1,460	5	1,310	3	492	2	476	2
July	1, 110	4	1,974	7	910	2	420	1
August	640	4	734	4	750	3	1,560	4
Sept.	1,095	4	400	2	980	2	690	2
Total	8,841	30	5,773	20	4,109	12	3,146	9_

It is considered that most of the deliveries to France (2,456 tons) and other countries (690 tons) and a part of the deliveries to Yugoslavia are being or will be shipped to Italy.

The export quota to Italy has been set this year at 12,000 tons. But it is reported that more than 3,000 tons of Japanese tuna has already entered Italy by transshipment from France and North Africa. If the sales of this tuna were made with knowledge that it would be diverted to Italy, it clearly constitutes a violation of the Japanese Government's export control measures, but there is no way of controlling this situation. At present there is absolutely no fear that these transshipments will break the Italian market, and the base price of \$280-\$285 c. & f. is being maintained. The present quota of 12,000 tons for Italy far from meets the demand. There has been no quota set up for the other European countries receiving Japanese tuna. (Nikkan Suisan Tsushin, August 21, 1959.)

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FROZEN TUNA EXPORTS, APRIL 1958-MARCH 1959:

During the Japanese 1959 fiscal year (April-March), 113,107 short tons of frozen tuna (valued at US\$30.6 million) were exported to the United States, Italy, and six other countries. The exports to the United States consisted of 67,148 tons of yellowfin (value US\$17,388,000), 27,207 tons of albacore (value \$8,772,000), and 6.195 tons of other tuna (value \$1,573,000). The United States imports of Japanese frozen tuna accounted for about 89 percent of the quantity and 90 percent of the value of the total frozen tuna exports. Japan's only other important customer for frozen tuna was Italy. This country imported 11,460 tons of yellowfin (value \$2,531,000) and 77 tons of albacore (value \$17,000).

In the latter half of 1958 and the first quarter of 1959, exports of Japanese frozen tuna caught in the Atlantic Ocean and shipped to the United States and Italy without being landed in Japan, began to play an important part in the export trade in frozen tuna. (See table on following page.)

Japanese Exports of Frozen Tuna by Destination and Species, April 1958-March 1959										
Destination			Quantity		Value					
Destination	Albacore	Yellowfin	Skipjack	Skipjack Big-eyed Total			Yellowfin	Skipjack	Big-eyed	Total
		(Sh	US\$1,000)							
From Japan:	1	•	1	1/		2/			1 2/ 1	
United States	25,862	48, 358	2,752	±/3,443	80,415	$\frac{2}{8,772}$	12,981	531	3/842	23, 126
Canada	948	-	-	~	948	466	-	-	-	466
Other	3	68	1	_	72	1	15	-	-	16
Atlantic Ocean Fishery:										
United States	1,345	18,790	_	-	20, 135	-	4,407	-	- 1	4,407
Italy	77	11,460	_	-	11,537	17	2,531		-	2,548
Total	28,235	78,676	2,753	3,443	113, 107	9,256	19,934	531	842	30,563

/Includes 10 tons of unclassified tuna.

1/Includes 10 tons of unclassified tuna.
2/Includes value of albacore delivered to U. S. from Atlantic Ocean fishery.
3/Includes value of 10 tons of unclassified tuna.
Note: Shipments of frozen tuna to "other" countries included small quantities to Belgium, France, Netherlands, United

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SUMMER ALBACORE TUNA FISHERY TRENDS:

With the Japanese summer albacore fishery drawing to a close at the end of July, landings were averaging about 150 metric tons daily. The albacore schools were moving east and late catches were being made at about 31°10'-32°30' north latitude and 158°00'-158°50' east longitude.

As the end of the season approached purchases by freezers of summer albacore increased and as of July 25 they were reported to have purchased 500-600 metric tons. In July there was less competition from the tuna canners for available supplies of albacore and exvessel prices and export prices were about in balance. Some sales of frozen albacore were reported to have been made to United States canners at US\$390 a ton f.o.b. Japan. A backlog of unfilled orders for frozen albacore, amounting to 1,000-2,000 tons which were originally booked at \$320 a ton f.o.b., makes it difficult to book new orders.

Almost all the tuna canners, with the exception of three large firms, had completed canning their production quotas of at least 35 percent whitemeat tuna by the middle of July. As a result, ex-vessel tuna prices dropped from about \$452 a ton late in June to about \$352-365 a ton in July. If the frozen albacore tuna exporters can maintain the export price of \$390-400 a ton, no losses will be taken.

One of the large Japanese fishing companies in July was offering mother-

ship-caught albacore for export to the United States. The first shipment was sold to a west coast United States canner at \$360 a ton f.o.b. This large Japanese firm estimates that about 4,000 tons of mothership-caught albacore will be available for export to the United States from the 1959 season. Almost all of this quantity is expected to be sold to a single United States tuna canner. (Nikkan Suisan Tsushin, September 28, 1959.)

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TUNA CANNERS TAKE STRONG POSITION ON SALES POLICIES:

Shizuoka Prefecture tuna canners held a meeting on July 31, 1959, at Shimizu and discussed measures to overcome the continuing slowdown of canned tuna sales to the United States market. The majority of the larger packers were present. The meeting agreed on three goals: (1) maintenance of the present price for lightmeat; (2) a \$1.50 per case increase from the going price for whitemeat (which would be \$2.50 above the price at the last round of sales); (3) an early reopening of sales by the Joint Sales Company.

The packers' strong position is considered to be supported by the whitemeat production which has been greater than expected, and it will be possible to sell 400,000 cases of whitemeat, so that the relative importance of lightmeat sales has decreased.

This unilateral agreement by the Shizuoka packers does not, of course, have the binding effect of a decision by any formal body, but it is considered certain that the packers' officials will in fact be-

gin negotiating along these lines with the trading companies. However, it seems likely that the trading companies, which have been calling for a \$1 a case price cut on lightmeat, are going to accept the packers' position. (Nikkan Suisan Tsushin, August 4, 1959.)

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TUNA INDUSTRY TRENDS, JULY 1959:

Exports: The value of Japanese tuna exports to the United States in the first 5 months of 1958 was US\$5,976,000 frozen tuna and \$5,154,000 canned tuna; for the same period of 1959 exports were \$8,861,000 frozen tuna and \$3,657,000 canned tuna, according to Japanese Customs data. (See tables 1, 2, and 3.)

July 1959 status of export quotas for United States was approximately 30,000 short tons annually of round albacore. For yellowfin shipped from Japan 35,000 tons, for yellowfin transshipments through foreign ports 120 landings, equivalent of approximately 35,000 tons. For albacore and yellowfin loins and discs combined 3,000 tons annually, which must be subtracted from round fish quotas at rate of 2 to 1. Samoa and New Hebrides exports are not included in these quotas.

Quotas for canned tuna in brine exports are determined by the United States tariff structure and consumption. Practically no tuna in oil is exported to the United States. Japanese canned tuna industry planning on 1059 exports to United States of approximately 2,450,000 cases.

Table 1 - Japanese	Frozen and C	Canned Tuna Expo	rt Validatio	ns for Shipment fr	om Japanese	Ports1/			
P = 1	Jan	June 1959	Jan.	-June 1958	Year 1958				
Product	To U. S.	To All Countries	To U. S.	To All Countries	To U. S.	To All Countries			
			(S	hort Tons)					
Frozen:	1								
Albacore, round	8,905	9,409	11,951	1 1, 952	21,537	21,637			
loins	752	1,036	8	8 8		402			
discs	-	9			-	- 0.4			
" flakes	16	16	74	74	84	84			
Total albacore	9,673	10,470	12,033	12,034	21,938	22, 123			
Yellowfin, gilled & gutted	18,822	19,230	17, 192	17,204	39, 366	39, 435			
loins	874	874	- 1	_	437	437			
discs			2 200	2 200	6 607	6 627			
" fillets	1,266 1,295		3,206	3, 206	6,627	6,627 121			
dressed	- 570		- 9	121	_	121			
CHUIRS		24	9	-	_	_			
Tranes	2	21,995	20,407	20,531	46,430	46,620			
Total yellowfin	20,964	32, 465	32,440	32,565	68, 368	68,743			
Total frozen	30,637					Year 1958			
	Jan	April 1 959	-	April 1958					
			(Sta	ındard Cases)					
Canned:				454 050		0.40 0.774			
Albacore, in oil		124, 178	-	121,078	236	242,971			
" in brine	245,137	245, 137	485,576	485,576	1,311,314	1,312,265			
Skipjack, in oil				18, 470	479	315,779			
in brine	298, 239	298, 239	205,252	205, 252	731, 102	742, 290			
Other lightmeat, in oil			PF 670	123, 838	66 000	313,505			
Other lightmeat, in brine	8,850 8,850		25,670	25,670	66,220	67,623			
Miscellaneous		9 11,621		2,116 982,000	3,267 2,112,619	51,477 3,045,910			
1/Does not include transshipments from other countries. Data supplied by Japan Frozen Food Exporters Association.									

Table 2 - Japanese Fresh and Frozen Tuna Transshipment Exports to United States from Direct Landing at										
Cristobal, Trinidad, and Haiti										
Product	Jan	, -June	Jan	une	July	-Dec.				
Liouder	1	959	1958		1958					
	Short		Short		Short					
i	Tons	US\$	Tons		Tons	US\$				
Yellowfin		3,638,794	2/	2/	10,241	$2,6\overline{32},917$				
Albacore	1,060			2/	515					
Total	16, 124	3,960,655	2/	2/	10,756	2,811,782				

1/Export license validations. Data supplied by Agricultural and Fishery Products Sections of MITI. From Japanese vessels fishing in the South Atlantic. 2/No fishing in Atlantic first part of 1958. Prices for Frozen: In July 1959 official Japanese frozen tuna export check
or floor prices f.o.b. Japan per short
ton were: albacore round \$270, loins
\$730, discs \$780. Yellowfin gilled and
gutted up to 80 pounds \$220, 80 to 100
pounds \$210, over 100 pounds \$190. Yellowfin dressed up to 120 pounds \$210,
over 120 pounds \$190. Yellowfin: fillets
regardless of fish size \$210, loins \$565,
discs \$615. Check prices for yellowfin
transshipped through Panama \$10 less

per short ton for all types. Although the tuna check or floor prices have not been increased, actual export prices are about \$360 a ton f.o.b. for round mothership albacore and the Japanese Frozen Food Exporters' Association were re-

Table 3 - Japanese Direct Landings of Fresh and Frozen Tuna at American Samoa and New Hebrides 1/

	-							_	
Product	_	 			_	_			 Year 1958
	_		_		_				Short Tons
Albacore									10,096
Yellowfin									2,254
Big-eyed	٥	۰	٠	۰			۰	۰	317
Total									12,667

1/Export license validations. Japanese policy is to limit American Samoa deliveries to 12,000 tons and New Hebrides deliveries to 3,600 tons annually. Deliveries to those islands are over and above Japanese overall frozen albacore and yellowfin export quotas, but direct landings at and transshipments from Carribean ports are included in over-all quotas.

reported to have raised the basic price for 20-80 pound (gilled and gutted) yellowfin tuna to \$245 a ton f.o.b., effective July 3, 1959. Price of yellowfin gilled and gutted delivered to Puerto Rico by large Japanese fishery carriers was reliably reported as \$250 per short ton c. & i. Basic price of yellowfin delivered to American Samoa was reported as \$190.

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TUNA MOTHERSHIP FLEET OPERATIONS IN SOUTH PACIFIC NEAR THE FIJI ISLANDS:

When the 3,710-ton Japanese tuna mothership Tenyo Maru No. 3 visited Suva, Fiji Islands, August 10, 1959, the fleet's fishing manager reported that fishing had proved very good since the ship left Japan. As of the date of the visit, 3,300 metric tons of the fleet's quota of 5,400 tons had been caught, and 56 percent of the catch was albacore tuna. The fleet expected to fill its quota by the end of August, at which time the mothership was expected to leave the fishing area--about 300 miles southwest of Suva--and return to Tokyo. The fleet's 35 tuna catchers were then to be serviced by the 7,600-ton mothership Koyo Maru, which was due in the area on September 1.

An additional 15 catcher boats were expected to join the 35 catchers already in the area. The Koyo Maru had a tuna quota of 5,700 tons.

Because the fishing had been poor in waters nearer Japan, the Fishery Agency was issuing a permit for an extra mothership fleet in the South Pacific this year--making four in all.

The mothership Jinyo Maru, 7,200 tons, built last year, was also scheduled to leave Tokyo on September 1 to operate in the area west of the Gilbert and Ellice Islands. This mothership is owned jointly by the owners of the other two motherships mentioned above. The Jinyo Maru has a catcher fleet of 30 boats and a tuna quota of about 5,700 tons.

Taking into consideration the 5,700-ton quota of the fourth mothership fleet operating in the South Pacific, there would be a total harvest of 22,500 tons from Japanese motherships in the South Pacific this year.

In addition, there are about 30 independent tuna boats, averaging about 250 tons gross each, or somewhat larger than the fleet-type catcher boats.

The Japanese Fishery Agency fixes the mothership quotas each season on the basis of results of earlier seasons. According to the Japanese, this season's catch and especially the high percentage of albacore in the catch, gave no indication that the Gilberts-Ellice-Fiji area was being overfished as yet.

The Nojima Maru, the fourth mothership, commissioned last December, visited Suva on August 5. This mothership left Kobe on May 15 for the South Pacific where she rendezvoused with her 36 tuna catcher boats two weeks later near the Ellice Islands, and within a few hundred miles of the Tenyo Maru No. 3, which had sailed from Tokyo on May 18 for the same area. At the time the Nojima Maru called at Suva, it had taken aboard 2,700 tons of fish of which 950 tons had been transshipped to the freezer vessel Aiko Maru in two shipments to Japan. The Nojima Maru expected to attain its quota of 5,700 tons by the end of September. The vessel was stationed near 220 south

latitude, 177° east longitude, within 70 miles of the Tenyo Maru No. 3. Both fleets worked their way south gradually along the west side of the Ellice Islands and Fiji. The tuna catcher boats of both fleets were operating over a wide area, some of them almost 1,000 miles from their respective motherships. The mothership Nojima Maru has a crew of 64 and 140 fish handlers. The crew of the Tenyo Maru is 55 and it also carries 119 fish handlers. (Letter from J. P. Shortall, Suva, Fiji, August 11, 1959.)

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TUNA VESSEL CONSTRUCTION CONTINUES AT HIGH RATE:

The Japanese tuna fishing industry at present is in rather good condition, and the large fishing companies are taking an optimistic view of its future, according to Suisan Keizai Shimbun (August 19 and 25, 1959), a Japanese periodical. Many Japanese firms are very enthusiastic for the tuna fishing business, and each are planning the construction of from 2 to 5 new vessels to add to their present tuna fleets.

All Japanese companies seem to be aiming at the tuna fishery, which, although smaller in scale than Antarctic whaling or North Pacific salmon fishing, is stable, and with plans for advance bases overseas, it looks as if the expansion of the tuna fishery next year will be more active than this year. One company has two 410-ton tuna vessels under construction and is also planning to buy a 500-ton vessel. One whaling company is building four 500-ton vessels, another a vessel of 680 tons, and a third company a 240-ton vessel.

In some quarters it is feared that this build-up of the tuna fleet may lead to depletion of the resources, but the majority opinion is that the question at present is not one of overfishing, but of finding good fishing grounds. On the trade front, there is optimism about the development in the future of markets other than the United States and Canada.

On August 19 a reception was held at the port of Yaizu for the new tuna longliner No. 3 Shoyu Maru. The vessel was built at Shimizu at a cost of 115 million yen (about US\$322,000), has such modern equipment as radar, fish-finder, electric harpoon, and well ventilated and insulated living spaces. Freezing capacity is 110 tons, carrying capacity full loaded is 230 tons of tuna, and the vessel can cruise for 150 days. The No. 3 Shoyu Maru will start her maiden voyage to the Indian Ocean around the end of August. Her over-all length is 44.4 meters (146 feet), beam 8 meters (26 feet), and she has a maximum speed of 13 knots with a 800-horsepower Diesel.

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FISHING VESSEL BUILDING PERMITS ISSUED BY JAPANESE FISHERIES AGENCY:

According to a summary table attached to the announcement of fishing boat building permits issued by the Japanese Fisheries Agency on August 7, 1959, the number of permits issued from the first of April 1959 through the first week in August totaled 333 vessels, representing 24,491 gross tons. The largest category was tuna vessels, with 88 permits issued. These included 21 steel vessels totaling 7,172 tons and 67 wooden vessels totaling 3,655 tons.

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TUNA FISHING COMPANIES OPERATING OUT OF AMERICAN SAMOA ASK FOR QUOTA INCREASE:

The two Japanese companies which are fishing for tuna out of American Samoa for the cannery in that Territory early in August made a joint request for an increase in the quota of tuna that they can handle, giving as reasons the expansion of tuna-processing facilities at Samoa and the stability of the operations.

The Japanese authorities appear disposed to grant this request on condition that the contract price of tuna supplied to the cannery is first raised above the August level. (Nikkan Suisan Tsushin, August 18, 1959.)

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TUNA VESSEL OPERATORS HOPING FOR MORE FUELING PORTS IN FOREIGN COUNTRIES:

Ports where Japanese tuna vessels can fuel in foreign countries now number more than 20, but the operators are hoping for a further increase in fueling bases close to the fishing grounds. At present the Ministry of Transportation has given to almost all fishing vessels of more than 200 tons gross the status of vessels engaged on foreign runs, and they are freely entering foreign ports for refueling. Even vessels which lack this status are, in some cases, fueling at foreign bases with the special permission of the foreign government.

Principal fueling bases at present are Madagascar, Capetown, Singapore, Colombo, Mobasa, Cristobal, Trinidad, Haiti, Recife, Belem, Dakar, Casablanca, Venice, Naples, Palermo, Port Said, Suva, Tahiti, Samoa, and Curacao. In general base arrangements are adequate for the Mediterranean and African areas, but the problem is considered to be bases for transshipments to the United States. (Suisan Keizai Shimbun, July 18, 1959.)

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PRELIMINARY TALKS HELD ON UNITED STATES-JAPAN MEETING ON TUNA PROBLEMS:

Preliminary Japan-United States talks on intergovernmental meeting on tuna problems began at the Japanese Agriculture Ministry's Sanbancho Annex on August 14, with the Japanese Agriculture Minister and the Fisheries Agency Director and Vice-Director on the Japanese side, and the United States Economics Minister and Fisheries Officer on the United States side. When the U.S. Secretary of the Interior visited Japan on July 26, met with the Foreign Minister, the Minister of Trade, and the Minister of Agriculture, and proposed an intergovernmental meeting, with participation of industry representatives, on technical aspects of tuna fishing, processing, and trade. Thereafter the matter was brought up concretely in talks between the Japanese Foreign Minister and the United States Ambassador and this led to the August 14 meeting.

At the August 14 meeting the United States representatives showed a desire to hold an intergovernmental tuna conference at Washington during September for a period of two weeks and with the delegations of each side to comprise 10 persons.

To this the Japanese side countered that Japan has set up a tuna regulatory council and is striving unilaterally for the stabilization of the United States tuna market, so that intergovernmental negotiations are inappropriate. If necessary, it is desirable that talks be held only at the industry level. The Japanese showed an intention to consider specific problems further at the level of working officials.

With respect to the five points proposed by the United States -- (1) investigation and conservation of tuna resources, (2) improving the efficiency of tuna fishing, (3) tuna processing technology, (4) improving the efficiency of marketing, and (5) expansion of tuna markets -- the Japanese argued back as follows: (1) the study of tuna resources is very difficult at present, so Japan would like to carry on the exchange of data among Japanese and United States research agencies; (2) Japanese and United States tuna fisheries are basically different, so it would have little effect to discuss them; (3) the Japanese tuna industry is constantly making positive efforts, so it is inappropriate to make this the subject of debate between governments; (4) Japan has set up a regulatory council and is giving thought to the condition of the United States market, so intergovernmental talks are inappropriate; (5) Japan has set up a special agency (the International Tuna Council) on the Ministry of Trade's budget and has requested United States participation, but this has not materialized because of a lack of unity in the United States industry.

The Japanese side proposed that talks should be carried on at the industry level, but the United States representatives held out for intergovernmental talks, and that is how the preliminary meeting ended. (Suisan Keizai Shimbun, August 15, 1959.)

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RESTRICTIONS ON HIGH-SEA FISHING:

Japan's salmon fishing fleet of 460 ships sailed out of Hakodate on May 15, 1959, for the fishing

grounds in the North Pacific Ocean. The annual departure has always been festive, with banners and bunting decorating the vessels. This year, however, their departure was not as spectacular for two reasons.

The protracted Japan-Soviet fishing negotiations delayed the sailing and Japan's salmon quota for this year was drastically reduced.

From ancient times, the Japanese have relied on the sea for much of their daily food. The waters which surround Japan abound in many species of edible fish, and have been the principal source of animal protein in the Japanese diet. Because some 90 million people have to live in an area of only 142,644 square miles, fish has become even more precious as a source of food.

For several years after the end of World War II, Japan was able to fish only in coastal waters because of Occupation restrictions and the loss of practically all her fishing vessels during the war.

With the abolition of the restrictions and the signing of the San Francisco Peace Treaty, the Japanese fishing industry made a remarkable recovery. Today, Japanese fishing vessels are operating in the Arctic, Antarctic, and Indian, Atlantic and Pacific oceans. They are seen even in such distant places as South American waters.

Japan's total exports of fishery products now come to about \$160 million annually (1958) and catches total 5,400,000 metric tons. Japan today is the leading fishing nation in the world, accounting for approximately two-fifths of the world's total haul. However, the operations of the Japanese fishing industry on the high seas are being subjected to certain restrictions.

The third Japan-Soviet fishery negotiations which opened in Tokyo in January 1959 were finally concluded after four months of protracted and difficult talks. Although negotiations on Japan's crab quota had already been settled in May, with Japan's catch curtailed to 280,000 cases or 10 percent less than last year, the talks on the crucial problem of Japan's salmon quota were not completed until May 13, after the salmon fishing season had already started. Japan's salmon catch in the area regulated by the Japan-Soviet Fisheries Convention was fixed at 85,000 metric tons as compared to 110,000 tons for last year and the 120,000 tons permitted for 1957. Thus, the results of the negotiations were not satisfactory to Japan.

The first Japan-Soviet fishery negotiations were held in 1956, with the aim of conserving salmon and other fish resources in North Pacific waters. The two countries agreed that the Japanese quota in the waters prescribed by the Fisheries Convention should be fixed annually by negotiations between the two countries. The Soviet Union has announced its own salmon quota every year but this has been merely a goal and does not mean that actual total catch must not exceed the announced quota.

During 1958 negotiations, the Japan-Soviet Fisheries Commission, established under the Conven-

tion, decided to suspend fishing in the Sea of Okhotsk during and after 1959. This decision was based on the consideration that the catching of salmon immediately before they went to their spawning grounds would not produce favorable conditions for their reproduction. This naturally narrowed Japan's salmon fishing grounds considerably.

Japan also concluded the North Pacific Fisheries Convention in 1952 with Canada and the United States. Uner this convention, Japan abstains from fishing for salmon of Canadian and American origin in the area west of 175° W. as well as herring and halibut off the coast of the North American Continent, while Canada and the United States continue to carry out necessary conservation measures for these species.

Two other restrictive areas are found west of the Japan Sea. These are the so-called Rhee Line, established unilaterally by the Republic of Korea, and the no fishing area established by Communist China, Proclamation of the Rhee Line by President Syngman Rhee in January 1952 has closed to Japanese fishermen a wide area of fishing grounds hitherto considered high seas. Although Japan does not recognize the validity of the Rhee Line, the Republic of Korea has been capturing Japanese fishing craft and crewmen operating near the line, and interning them. This is one of the focal points in Japan-Korea negotiations, and it was also taken up at the Geneva talks concerning the problem of repatriating Korean nationals living in Japan. Two Japanese women representing the families of men still held by the Korean Government went to Geneva to appeal for the return of their husbands and sons.

The off-limits fishing area along the coast of the Chinese mainland is based on the Fisheries Agreement between private interests of Japan and Communist China concluded in Peiping in April 1955. This agreement expired in June last year, but Japanest fishermen are continuing to abstain from operating in the area.

In 1953, Australia claimed jurisdiction over the continental shelf adjacent to its coast and also announced it would apply the Australian Pearl Fisheries Act of 1952/53 to all who engage in pearling outside the territorial waters within the continental shelf area. A dispute arose between Japan and Australia on these points, and hampered Japanese pearl fishing in the Arafura Sea. The Arafura Sea is located north of Australia and is famous for its mother-of-pearl oysters.

The term "continental shelf" is defined as referring to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters permits the exploitation of the natural resources of those areas.

The two countries decided at the end of 1953 to refer their respective claims to the International Court at the Hague. However, an agreement was reached between Prime Minister Kishi and Premier Menzies when the former visited Australia at the end of 1957, to postpone indefinitely the appeal to the International Court of Justice. They agreed that Japan's pearl oyster catch would be limited to a certain quota to be fixed annually by negotiation be-

tween the two countries. However, in 1958, the International Conference on the Law of the Sea in Geneva recognized that living organisms belonging to sedentary species on continental shelves are to be exclusively claimed by the coastal countries. Thus, Japan's position concerning the Arafura Sea seems to have been weakened considerably. The Japanese catch of pearl oysters, 1,000 tons in 1956, was gradually curtailed and the 1959 quota was 375 tons as compared to 470 tons in 1958.

It was mainly because of the freedom to fish in the high seas--one of the fundamental principles of international law--that Japan managed to develop her fishing industry to its present high level. Unfortunately, however, this principle is being violated in some cases and Japanese fishermen are gradually being shut out from the high seas.

Three reasons can be found for the growing restrictions:

The first reason lies in the problem of conserving marine resources. It is generally agreed that catch quotas are necessary for the conservation of fish resources. However, because of the lack of scientific data on marine resources, the recent Japan-Soviet fishery negotiations ended without establishing why salmon resources are diminishing. If more thorough research were carried out in this direction a more equitable salmon quota could be fixed. Japan is willing to carry out a scientific study on salmon resources.

Another reason for the reduction of high-seas areas open to fishing is the expansion of territorial waters. It has been a standing international precept up to the present that territorial waters extend three nautical miles from a country's coast. But recently, some countries are claiming that waters extending 12 nautical miles and even 200 miles offshore are their territorial waters. During last year's International Conference on the Law of the Sea, Japan, as well as such countries as the United States, Britain, West Germany, Sweden and Greece, advocated a three-mile limit on territorial waters. However, South and Central American, Southeast Asian, Arab, and Communist nations claimed a 12-mile limit. No definite conclusion was reached by the conference.

The vast majority of opinion appears to favor limiting territorial waters to between 3 and 12 nautical miles. At any rate, it is urgently desirable that some sort of international decision be reached on this problem.

The third reason is concerned with the problem of distribution of marine resources from the standpoint of conserving fish resources. This problem, of course, is interrelated with the first reason. The problem lies in the fact that Japanese fishing operations in coastal waters are being restricted or completely shut out even though there is no scientific data to justify such a lockout.

For example, the Soviet Union in its negotiations with Japan claimed that it had priority in fishing for salmon because the salmon had been spawned in rivers in its own territory. In the case of the Japan-United States-Canada fishery agreement, the latter two countries have com-

pletely barred Japan from fishing in a certain area, claiming that the two countries alone are catching the allowable limit of the fish. Furthermore, it is reported that there are movements afoot in the United States Congress directed at further restrictions on Japanese salmon fishing.

At the four-nation whaling conference held recently in Tokyo--Japan, Britain, the Netherlands, and Norway failed to agree on the distribution among them of the quota catch of 12,000 whales.

The fishing industry not only provides the Japanese with necessary animal protein but also provides exports which earn needed dollars. Domestically, Japan must rationalize its fishing industry. This will necessitate extensive measures to alleviate the present plight of small fishing companies as well as individual fishermen. Japan must also devise means of utilizing the limited marine resources to their fullest. Many fishing firms have already initiated the canning or packing of fish meat into hams and sausages. However, there are certain limits to domestic measures, and if the situation continues as at present the Japanese fishing industry will be faced with increasing difficulties.

As one way to cope with the situation, some Japanese fishing firms are starting to develop new fishing grounds in cooperation with such countries as India, Burma, and Argentina which are trying to foster and develop their own fishing industry. (Japan Report, July 15, 1959, Consulate General of Japan, New York City.)

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TUNA FISHERY FEDERATION PUBLISHES WHITE PAPER ON INDUSTRY PROBLEMS:

Late in July the Japan Federation of Tuna Fishery Cooperative Associations issued a report entitled "The Present Situation and Problems of the Tuna Fishing Industry," copies of which were widely distributed within the fishing industry and in Government fishery administration circles. The purpose of the pamphlet is to express the Federation's opposition to a proposed redeployment of excess salmon fishermen into the tuna fisheries, and to explain the conditions in the tuna fishing industry which make the entrance of additional fishermen undesirable.

The report stresses the importance of the tuna fishing industry in Japan's economy, pointing out that tuna boats make up nearly 20 percent of the powered fishing boat tonnage and land nearly 10 percent by weight of Japan's total marine fisheries catch. Tuna products make up the biggest single category—over 28 percent—of Japan's fishery exports, which in turn are about 6 percent in value of all Japanese exports.

The industry is said to be in a generally weak financial condition. About 65 percent of the tuna boats are operated by individual owners, and most of the so-called company operations are smallscale and inadequately capitalized. An apparent decline in the abundance of tuna on near grounds has forced the operators to build larger vessels with which to reach more productive distant waters, and the lack of adequate capital or government financing for this building has put many of them in a precarious financial condition. Productivity appears to be on the down-grade even on the newer distant fishing grounds, while operating costs are going up as longer trips become necessary.

Among other serious problems of the industry, according to the report, are strongly fluctuating prices, inability to forecast accurately the seasonal abundance of fish, and very slow expansion of domestic consumption of tuna. The Federation is strongly opposed to any expansion of the over-all scale of production, i.e., the number of boats and fishermen, until a greater degree of stability has been achieved at the present level of development. Among the solutions proposed for some of these problems are changes in the government's regulations that would allow owners of boats of under 100 tons gross to build replacements of greater size and efficiency, which is not possible under the present licensing system, or the acquisition of rights to use bases closer to the tropical tuna grounds, so that smaller vessels could operate more efficiently.

The report shows a strong awareness of the importance of the export trade to the tuna fishing industry, stating that about 40 percent of the tuna catch is exported, and 80 percent of this to one market, the United States. With domestic consumption showing little growth, the only key to the future is held to be an orderly expansion of exports. In this connection, the report places great emphasis on the need for effective measures to prevent excessively cheap exports and to insure orderly marketing. (United States Embassy dispatch form Tokyo of August 6, 1959.)

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CANNED SALMON SALES OF 1959 PACK:

The first round of sales of canned salmon for the United Kingdom was closed by the Japanese Joint Sales Company on August 5, and it is certain that contracts will be made for the total quantity of red, pink, and chum salmon. Attention in the industry is now being centered on the timing and sales methods for the second round of sales. It was expected that between August 10 and 15, when private arrangements on silvers would have been ascertained, a supplementary sale would be held.

In some quarters an early supplementary sale on pinks is desired, but there is rather strong fear that for such a sale to be held before the goods sold in the first round reach their destinations might soften the market, and so it is considered certain that no such supplementary sale will be held at least until after announcement of the United States and Canadian opening prices, slated for the latter part of August. It is thought that if this is done, there may be considerable possibility of another price rise.

Of the canned salmon offered at the first round of sales, about 125,000 cases of 4-dozen red sockeye No. 2's and about 70,000 cases of 4-dozen pink No. 4's for early shipment were sold to the United States, and a second pink sale was scheduled shortly. The Joint Sales Company closed bidding by United States buyers for the time being on August 5, and will determine the amount of sales on that basis. However, the pack of pink No. 4's is less than half of the quantities ordered, and sales will probably be held within 200,000 cases. It is expected that quantities of pink No. 2's available will just about match the orders received. It seems most likely that the second round of sales will settle on a figure of about 300,000 standard cases. (Nikkan Suisan Tsushin, August 5.)

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EXPANSION OF TRAWL FISHERIES IN NORTH PACIFIC:

Japanese expect that there will be a great boom in the North Pacific trawl fisheries this year and next year, because of the increasing operations of fish-meal and frozen-flatfish fleets.

Japan (Contd.):

These fisheries, however, face increasingly serious problems with respect to bottom fish resources, administrative guidance, relations with other fisheries, and the economics of operation. Although at the present time the magnitude of the northern bottom fish resources is not clear, the authorities and the industry are setting up optimistic estimates, planning additional fleets, and considering the fisheries as a possible place in which to redeploy excess fishing power resulting from reorganization of the salmon fishery. At the same time, there are plans for sending out more fleets to produce frozen flatfish, as the popular market for this product grows. On the other hand, some elements in the industry doubt whether the bottom fish resources are capable of supporting 10 or more fleets.

There are already plans for sending six fleets to the Bering Sea and the Okhotsk Sea in September to produce frozen flatfish. This year there are two fish-meal fleets in operation, but it is expected that next year this number may increase to six, if the plans of the operating companies materialize. At this rate, the frozen flatfish operations will take 30,000 metric tons of fish, and each of the fish-meal fleets will use from 70,000 to nearly 100,000 tons of flatfish and Alaska pollock. The total catch of bottom fish, if all fleets operate as planned, will be over 500,000 metric tons.

Considering the fleet operations in detail, the 9,600-ton Kinyo Maru and the 11,000-ton Tenyo Maru are operating as fish-meal factoryships in the Bristol Bay area, each using 22 trawlers. Early in September the 9,800-ton Miyajima Maru, the 7,400-ton Kashima Maru, the 7,500-ton Criyo Maru, and the 10,000ton Kyokusan Maru, each with a number of trawlers, sailed to the Bering Sea to produce frozen flatfish, while the 7,400ton Itsukushima Maru and the 7,400-ton Eijin Maru departed for the Sea of Okhotsk for the same type of operation. The fish-meal factoryships sailed in April and the frozen flatfish fleets in September, and if the plans for increasing the number of fish-meal fleets materialize, the latter part of the fishing season next

year may see more than 10 fleets on the north Pacific grounds.

The effect on the resources is not the only problem. There is also that of the physical capacity of the fishing grounds. On August 10 the Japanese authorities closed an area to fish-meal fleet operations because of possible effects on crab resources. This was an area on the east side of the fishing grounds around 57° N., 1650 W., an area of good catches which is essential in order to make fish-meal fleet operations pay. The operating companies say that the value of their fishing grounds has been cut in half by this action. Not only have the grounds on the Bristol Bay side been shaved back because of the relation to the crab resources, but they are pinched on the north by the Soviet crab fleet, and to the west, on the Bering side, by the Soviet trawling fleet of 48 ships, so that it seems to be a question whether there is room for 10 or more fleets to operate. (Suisan Keizai Shimbun, August 16, 1959.)

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LANDINGS OF FISHERY PRODUCTS INCREASED IN 1958:

Japan's total landings of aquatic products (excluding whales) in 1958 amounted to about 5.5 million metric tons (about 12.1 billion pounds), as compared with 5.4 million tons (about 11.9 billion pounds) in 1957. The lower rate of increase of about 2 percent, as compared with an increase of 13 percent from 1956 to 1957, is an indication that the expansion of Japanese fisheries production may be reaching its limits. The average price to the producer for all aquatic products was down by 9 percent in 1958 from the preceding year.

Landings from general marine fisheries, fresh-water aquiculture, and whaling increased, while landings declined in fresh-water fisheries and marine aquiculture, the latter primarily because of the poor laver (edible seaweed) crop. Among the important species, skipjack tuna, saury or jack mackerel, and sand launce landings were up; albacore tuna, sardine, herring, and Atka mackerel catches dropped considerably.

Statistics compiled on the worldwide landings of tuna by Japanese boats in

Japan (Contd.):

1958 show a total of 416,246 metric tons for all species, of which 10,710 tons were produced by mothership fleets, and 43,946 tons were landed in foreign ports from Samoa to Haifa, Israel. Ex-vessel tuna prices were generally higher than in 1957: the average price of bluefin tuna was up 86 percent, to \$567 a short ton, because of the short catch; yellowfin, at \$234, was up 10 percent; and bigeyed, at \$257, was up 7 percent, the United States Embassy in Tokyo, reported on July 7, 1959.

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A JAPANESE AND A UNITED STATES COMPANY PLAN TO CAN OYSTERS IN JAPAN:

In mid-August a Japanese fishing company entered into an agreement with a United States west coast oyster canning firm under a provisional contract for the production of canned oysters using Hiroshima oysters as raw material. The president of the United States company arrived in Japan on September 7 to work out the details of the plan.

According to the plan, a factory will be built in Hiroshima with capitalization of about 250 million yen (US\$694,000). An engineer and an inspector will be sent from the United States. Canned oysters will be produced to meet United States pure food standards and the product will be exported to the United States oyster company. A trading firm of Nozaki is also involved in the agreement.

The cannery will pack small shrimp and fruits during the oyster off-season, and it is estimated that annual sales will amount to about 600 million yen (US\$1.7 million). (Nikkan Suisan Tsushin, September 7, 1959.)

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INVESTIGATE FROZEN RAINBOW TROUT EXPORTS TO UNITED STATES:

Since last year the price of Japan's frozen trout exports to the United States has been steadily dropping because of overproduction and competition from Danish trout. Towards the end of August the price was down to 33 to 34 U.S.

cents a pound c.i.f. United States west coast port.

It is reported that the U. S. Treasury Department has taken note of this situation and has instructed the United States Embassy to investigate to see whether or not there is any suspicion of dumping in connection with rainbow trout exports.

The August 1959 landed price for trout in Japan was about 500 yen per kan (8.27 pounds) or 17 U. S. cents a pound, but it went down to 400 yen (13 cents a pound) for a while, so the average is about 450 yen per kan or about 15 cents a pound. (Nikkan Suisan Tsushin, August 25, 1959.)

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COMPANY FORMED TO HANDLE FUR-SEAL AND OTHER MARINE-ANIMAL SKINS:

A Japanese company has been formed, capitalization 20 million yen (US\$55,600) to handle marine-animal pelts or skins. The Company's first activity was expected to be a bid on 2,847 fur-seal skins offered at Osuchi on August 26.

The company will engage in general development of marine leathers; utilization of the hides of such salmon predators as salmon sharks, sea lions, and porpoises; improvement of tanning technology and export of products; and mink rearing in the colder parts of Hokkaido.

Up to the present time the Japanese Government has consigned its 15-percent share of seal skins taken under the North Pacific Fur Seal Treaty to a Saint Louis, Mo., Company, and has received the money from their sale. The new Japanese company will try to have these pelts sold in Japan, as a way of encouraging development of a new business. (Nikkan Suisan Tsushin, August 22, 1959.)

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SURVEY OF FISHERMEN'S LIVING STANDARDS:

The Fisheries Department of Kagawa Prefecture is trying to improve the living standards in fishing villages, which are lagging far behind those of farming villages. This spring the Department's newly-established Fishing Village Liveli-

Japan (Contd.):

hood Improvement Guidance Section carried out a survey of the actual living conditions of fishermen's families, with the cooperation of the women's auxiliaries of 15 fishery cooperative associations in the Prefecture.

Some of the major points revealed by the survey were as follows: The monthly average budget for the families in each cooperative ranged from a high of 22,000 yen (US\$61.60) to a low of 8,000 yen (US\$22.40), with four cooperatives reporting average budgets of less than 10,000 yen (US\$28). The majority of the families reported that they could not live on their earnings from fishing alone, the difference being made up by farming, day labor, and borrowing.

On the question of whether they would encourage their children to take up fishing as a career, the cooperative with the highest percentage of affirmative answers reported only 40 percent, while all members of six cooperatives replied in the negative. (Nippon Suisan Shimbun, August 21, 1959.)

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TRADE AGREEMENT WITH ITALY INCLUDES TUNA:

Italy and Japan agreed sometime ago to conclude a new trade agreement, but it has been put off month after month.

Recently, the Chief of the Trade Promotion Bureau, Italian Ministry of International Trade, was reported to be due in Japan and preliminary negotiations were expected to begin at the end of July.

Frozen tuna can only be exported to Italy in barter for Italian rice and unless Japan buys rice, tuna cannot be exported even though orders for frozen tuna are received from Italy. The Japanese tuna industry, therefore, has been making a strong representation urging speedy conclusion of a new trading agreement so as to make tuna exports more freely. With the prospect of the renewal of the Italian-Japanese trade agreement the Japanese tuna industry became more optimistic regarding future trading in frozen tuna. (Industrial News, July 25, 1959.)

Republic of Korea

SHRIMP CATCHES IN DEEP-WATER DURING OFF-SEASON PROMISING:

A Korean fishing company reported good catches of shrimp in deep water off Pohang in July 1959. The vessel fishing for shrimp is operating under the guidance of Fisheries Research Station technicians. The catches made are significant because heretofore commercial shrimp fishing had not been carried out during the summer. It is considered an important development because attempts are being made to fish for shrimp off Korea year-round. (U. S. Operations Mission in Seoul, August 21, 1959.)

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TWO MODERN TRAWLERS ADDED TO FISHING FLEET:

Two 80-ton trawlers arrived in Korea from Japan at the end of June. The vessels are equipped for multiple-purpose fishing, are completely refrigerated, and are of modern Japanese design and workmanship. They were expected to start trawling for fish as soon as customs formalities had been completed. (U. S. Operations Mission in Seoul, August 21, 1959.)



Mexico

EXPORT DUTY CUT ON SHRIMP FROM SOME AREAS:

Effective August 30, 1959 (Diario Oficial, August 27, 1959) Mexico lowered the export duty on frozen shrimp originating from the Gulf of Mexico, Salina Cruz, Oaxaca, and Santa Rosalia, Baja California, by about 0.75 U.S. cents a pound. At the same time the export duty on fresh or iced shrimp of the same origin was lowered about 4.2 U.S. cents a pound. The change in duty was effected by decreasing the official price, upon which duties are calculated, from 1,700 pesos per 100 net kilograms to 1,250 pesos (from about 61.8 cents to 45.4 cents a pound). Duties for shrimp from other points in Mexico remain as previously (about 2.9 U.S. cents a pound for frozen and about 15.75 cents a pound for fresh or iced). Before the present reduction

Mexico (Contd.):

the export duties throughout Mexico were the same irrespective of the origin of the shrimp.

Practically all shrimp exported from Mexico are frozen. The present duty change will give producers in the Gulf of Mexico and Salina Cruz a slight relief from low production and falling prices in the United States market.

Frozen shrimp in 1958 ranked fourth in Mexican exports with a value of about 400 million pesos (about US\$32 million). In 1959 Mexican shrimp exports through June were about 50 percent higher than during the same period in 1958. This ratio dropped during July and August owing to a closed season in the Pacific. (United States Embassy dispatch from Mexico, September 4, 1959.)

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NEW SHRIMP FREEZER AND FISH CANNERY:

A combined shrimp freezing plant and fish cannery is under construction at Santo Domingo, Baja California, Mexico. Freezing capacity will be 26,000 pounds daily with storage capacity for 600,000 pounds of frozen shrimp. The plant will also produce 50 tons of ice daily and have storage space for 500 tons.

In addition to freezing shrimp (the principal objective) and some fish, the plant will can tuna, sardines, and abalone. Completion date for the freezing section is scheduled for the end of November 1959, and January 1, 1960, for the cannery.

Santo Domingo is on the west coast of Baja California at approximately $25^{\circ}30^{\circ}$ latitude. It is situated in the lagoon area which connects with the northern end of Magdalena Bay.

During the past two seasons, the area along the west coast of Baja California between Scammons Lagoon and Cape San Lucas has been quite productive in shrimp. The freezing plant is being constructed to eliminate the costly transport of the catch to plants on the mainland or

in Mexicali. (United States Embassy dispatch from Mexico, August 28, 1959.)

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SHRIMP FISHERY TRENDS, AUGUST 1959:

Shrimp production and exports by Mexico were down during August 1959 due to the closed season for shrimp trawling in the Gulf of California which began on July 16 and ended on September 15. Bay fishing in that area began on September 1, but catches were not expected to be higher than in 1958 because of the low price of small shrimp on the United States market.

Falling prices on the United States market during August caused considerable distress in the Salina Cruz fisheries. Prevailing prices paid on shrimp smaller than 25 to the pound were generally less than the cost of production. To alleviate the situation somewhat, the Government at the end of August reduced export duties on frozen shrimp by about $\frac{3}{4}$ of a U. S. cent a pound. This reduction only affected shrimp exports originating from the Gulf of Mexico, Salina Cruz, Oaxaca, and Santa Rosalia, Baja California.

At Ciudad del Carmen fishing improved a bit the latter part of August but still was averaging less than one ton of headless shrimp per 10- to 12-day trips. Catches at Campeche were somewhat less. Salina Cruz catches were reported to be a little better than those in the Gulf of Mexico.

Carmen landings were about twothirds pink and one-third white shrimp with a smattering of browns. About 45 percent of the catch was 26 to 30 count and under.

Campeche landings were about 95 percent pink and 5 percent white with no browns reported. The sizes of the shrimp in the catches ran larger than at Carmen. About 65 percent were 26 to 30 count and under, states a dispatch (September 4, 1959) from the United States Embassy in Mexico.

Morocco

CAMPAIGN LAUNCHED TO INCREASE USE OF FISH AND FISH FLOUR:

The first real attempt to fulfill the hope that Morocco increase her consumption of fish was 'Operation Poisson," a campaign launched by the Ministry of Health in two low-income neighborhoods in Rabat. The advantage of such an increase would be: (1) to absorb a part of Morocco's overproduction of sardines, and (2) to supplement the population's protein-deficient diet. Although concentrating on the sale of fresh sardines, the campaign also aimed at popularizing the use of a fish flour produced in Safi for human consumption. Much publicity has been given to the drive by the press. Permanent effects are difficult to estimate, and sales may fall off when the fanfare subsides, but the results of the campaign exceeded the expectations of the government.

The fish flour (Farine Alimentaire de Poisson--80 percent protein) is a whitish powder, slightly fish-flavored, made from dressed sardines. The process was developed by a chemist, who worked in cooperation with the Food and Agriculture Organization, which has since taken an active interest in the product and has sent experts from time to time to make tests. A pilot plant capable of producing a ton of fish flour a day went into production in August 1958, and the flour has since been used by the Government in orphanages and hospitals.

The importance of the product to Morocco (and to many other countries with protein-deficient diets) lies in its low price, its keeping quality, and its high protein content. It is not yet sold commercially except in pharmacies, but the factory-door price is only 192 francs a kilogram (about 20.7 U.S. cents a pound at rate of exchange 420 francs equal US\$1). The normal supplementary protein needs of an adult in Morocco can be satisfied by 25 grams (about 0.9 ozs.) of fish flour a day, which costs about five francs or a little over 1 U.S. cent. Although the retail price would no doubt be considerably higher due to distribution and packing costs, the price is still extraordinarily low for a high-protein food. A kilogram (2.2 lbs.) of fish flour is said

to be the equivalent of about seven kilograms (15.4 lbs.) of red meat.

The fish flour is presently packed in polyethylene bags and is said to keep very well. When mixed with spicy Moroccan foods, the fishy flavor of the product can be concealed to some extent. During the campaign, the flour was baked into a kind of Moroccan bread made with anise and ginger which reportedly had no fishy taste. (United States Consulate in Casablanca, September 8, 1959.)

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FISHERIES TRENDS, JULY 1959:

On June 10, after the first three days of fishing, the owners of the sardine fleet of Safi, Morocco, decided unanimously to keep their boats in port rather than yield to the demands that the fishing crews be chosen by the fishermen's union rather than by the boat-owner. On June 19, after Government intervention, the union conceded that the owners have the right to select their crews. Work was immediately resumed, and some boats went out on the day of the settlement.

During the first three days of fishing, 95 percent of the catch was sold to fish meal and oil plants and the rest frozen for export. The canneries, which used to buy most of the cannable sardines, had not yet opened. There remain about 700,000 cases of canned sardines from the 1958 season, which because of Morocco's failure to devalue her franc along with French franc will be hard to sell in France.

The devaluation crisis has also had the effect of completely stopping the export of shrimp to France. This product in 1958 brought in 400 million francs (about US\$952,000). France has turned to less expensive suppliers including Italy, Egypt, and the Scandinavian countries.

France is expected to renew the customs free import quota for Moroccan sardines and admit up to 600,000 cases of canned sardines and 3,000 metric tons of frozen sardines. It is probable that without this advantage on the French market, the fish-canning industry in Morocco, already in dire straits, would col-

Morocco (Contd.):

lapse. There is great concern that France's obligations to the Common Market may prevent her from continuing to permit customs privileges to Morocco.

Moroccan fishing boats have been selling fish to French and Portuguese boats out at sea rather than landing their catches. The sale is illegal because it evades the landing tax. The price received is not known, but it presumably exceeds that expected in a Moroccan port where most fish are sold to byproducts plants.

Large French sardine boats continue to fish off the Moroccan coast but outside the six-mile limit. The fish are frozen aboard ship and taken back to France for canning. The Moroccan fisheries industry, thus bypassed, is eager to have Moroccan territorial waters extend out twelve miles, which is about the average extension of the continental shelf.

The fish meal and oil plants until now the only prospering segment of the fisheries industry, are finding themselves hard pressed and are rebelling at the relatively high price they must pay for their fish $(9\frac{3}{4}$ francs per kilogram or about US\$21.00 per short tonand 11 francs or about US\$23.75 per short ton after July 31). The fish meal plants are not working in Agadir and fish are being caught there only for freezing and for a very small sardine canning activity.

The electrical fishing experiments which have gone on for over a year off the Moroccan coast have so far failed completely, the United States Embassy in Rabat reported on July 29, 1959.

Note: Moroccan francs converted to US\$ at rate of 420 francs equal US\$1.



Netherlands

UNDERWATER STUDIES OF TRAWLING:

Working with the Institute for Fishery Research at Ijmuiden, Dutch frog-

men for the first time have observed the reaction of fish along the sea bed as they are caught in the nets of a trawler. The study was carried out on the sea bottom by four amateur frogmen, at a depth of between 50 and 60 feet, 12 miles northwest of Ijmuiden on the Dutch coast.

The most surprising result of the study, according to the Institute, was the discovery that about 20 percent of the fish caught escape through the meshes when the trawl is drawn up from the sea bed. The frogmen also reported that flatfish did not move until the trawl was only about six inches away and then swam upwards to try to keep ahead of the net. The fish usually gave up this effort after about 30 seconds.

Owing to the success of the tests and the amount of study material produced by them, plans are now being made to train frogmen for work exclusively with the Institute during which underwater cameras will be used. (United States Embassy, The Hague, June 25, 1959.)



SHRIMP FISHERY TRENDS:

Shrimp fishing off the Caribbean coast of Nicaragua has been quiet since the beginning of 1959 and the Collector of Customs reported only 154,000 pounds exported during the first quarter of 1959. The Compania Maritima Mundial Sociedad Anonima of Nicaragua has been granted a 10-year concession to fish off the Atlantic coast and a United States company from Florida asked for a concession to fish off the same coast.

SHRIMP LANDINGS AND EXPORTS:

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Landings: Prior to 1958 shrimp fishing in Nicaraguan waters was done primarily to supply the domestic demand and few shrimp were exported. Since the Nicaraguan market is small (population 1,400,000), probably not more than 220,000 pounds of shrimp were caught each year from 1954 to 1957. In 1958 a law for the development of the country's natural resources was approved and foreign companies, primarily Panamanian

Nicaragua (Contd.):

and American, began fishing for shrimp off both coasts of Nicaragua by virtue of licenses granted by the Nicaraguan Office of Natural Resources (Oficina de Riguezas Naturales). The catch in 1958 was estimated by the Office of Natural Resources at 728,000 pounds of which almost 617,000 pounds were exported -includes both shrimp (90 percent) and lobster (10 percent). The catch in 1959 should exceed the 1958 catch.

Exports of Crustacea and Mollusks: Nicaragua's Customs Collector includes shrimp under crustacea and mollusks, code 031-03 of Nomenclature Arancelaria Uniforme Centroamericana, published by the United Nations in December 1955.

A total of 1,000 pounds, valued at US\$746, of shellfish (mostly frozen shrimp) were exported to Costa Rica in 1954 and 1,300 pounds, valued at \$700, were exported to the United States in the same year. There were no exports during 1955 and 1956.

A total of 1,200 pounds valued \$575, were exported to Costa Rica in 1957 and 1,600 pounds, valued at \$750, were exported to Panama in the same year.

A total of 6,000 pounds, valued at \$3,600, were exported to Panama in 1958 and 603,000 pounds, valued at \$315,721, were exported to the United States in the same year.

During January and February 1959, 101,000 pounds valued at \$55,497, were exported to the United States. (United States Embassy, Managua, report of June 8, 1959.)



Norway

FISHERMEN'S MARKETING ORGANI-ZATION ENDS EX-VESSEL PRICE DISPUTE WITH FILLET INDUSTRY:

North Norway's fishermen's marketing organization (Norges Raafisklag) in July 1959 agreed to comply with the Norwegian Ministry of Prices and Wages directives calling for a reduction

in the price spread between ex-vessel prices paid by the filleting and freezing industry (Norsk Frossenfisk) and other processors. The fishermen's organization also announced that it will honor the terms of an agreement with the filleting and freezing industry on summer fish prices. In turn, the filleting and freezing industry announced that it had withdrawn its breach of contract suit against the fishermen's marketing organization.

The long-standing dispute between the fishermen's marketing organization and the filleting and freezing industry over ex-vessel prices appears to have been settled, if not permanently, at least for the time being. (United States Embassy dispatch from Oslo dated July 31, 1959.) Note: Also see Commercial Fisheries Review, June 1959, p. 73.

Pacific Islands Trust Territory

FISHERIES IN 1958:

The potential fishery resources of the Trust Territory of the Pacific Islands 1 are substantial. Subistence fishing is an important daily activity for most of the inhabitants. Fish and other seafood provide the chief source of protein for the local diet. Fishing is carried out mainly on the reefs and in the lagoons; a limited amount of deep-sea fishing is done.

The potential of commercial fishing is recognized, and the Administering Authority for a number of years has been exploring ways and means of developing this important asset. A fisheries biologist was employed in 1958 to survey the fishery resources of the Territory and assess the fisheries potential and need of the various districts. Following the completion of this survey, it was determined that initial development efforts would be made in the Palau District. A subsistence fishing project was conducted during the year in that district and a small-scale commercial fishing project begun.

A substantial concrete dock, a steel shed, together with adequate adjacent land was obtained for the fisheries project and rehabilitation of the build-ings started. The items of equipment necessary to the initial plant such as a freezing unit, ice plant, and the like have been purchased and are awaiting installation. The fisheries biologist made arrangements in Japan for the construction of a 20-ton fishing vessel, which will operate out of the Palau fisheries project headquarters. The delivery of this fishing vessel was scheduled for November 1958. The goal of the fisheries project is to cut down the Trust Territory's imports of canned fish in Palau and elsewhere in the area by instituting efficient

JUnder Trusteeship of the United States since July 18, 1947, Occupies a vast ocean area of some 3 million square miles in the Western Pacific north of the equator and consists of three major island groups—the Marshalls, the Carolines, and the Marianas. Administered by a High Commissioner under the supervision and direction of the U. S. Secretary of the Interior.

Secretary of the Interior.

Pacific Islands Trust Territory (Contd.):

fishing and fish-preserving techniques, which could be operated by local industry. Plans called for the opening of a fish-processing plant for the preservation of fish by methods other than by canning to be in operation by mid-1959. Eventually it is hoped that an experimental small-scale pilot canning plant can be put into operation.

To a very limited degree, localized commercial fishing is being carried on presently in the Ponape and Palau Districts. In Ponape limited freezing facilities are available at the district center and local fishermen are able to sell their catch for local use and for export to the neighboring Marshall Islands and Truk Districts for use of administration, school, and hospital activities. In 1958 Ponape fishermen provided some 27,000 pounds of fish for this purpose. During the year fishermen of the Palau District shipped approximately 14,000 pounds of fish to Guam, which was double the amount shipped in the previous year. In addition, some 1,400 pounds of crabs were shipped to the Guam market. Lack of equipment, storage facilities, and uncertain markets have kept this localized commercial fishing on a small-scale basis. During the year a certain amount of localized commercial fishing was attempted at the Truk District Center. Saipan District exported some 4,000 pounds of fish to the Guam market during the year. In addition, sizable amounts are sold there in the local markets.

In 1958 a training and demonstration program in subsistence fishing was established in Palau. The two Micronesian fisheries trainees who had attended the South Pacific Commission Fisheries Training Course in 1957 and who later in that year worked with the Pacific Oceanic Fisheries Investigations of the U.S. Fish and Wildlife Service in Honolulu joined the staff of the fisheries biologist. Courses of instruction in net making and repair were given to the students of Palauan schools. The Subsistence Fisheries Project also constructed several different types of nets and tested them in Palau waters. Through the development of a program of subsistence fishing, the Administration hopes to enable the Micronesians to better utilize the valuable resources of the sea.

The marine biologist working in the Territory completed his contract during the year under review. The various programs that he originated during his $2\frac{1}{2}$ -year assignment will be carried on under the direction of the fisheries biologist. During 1958 the marine biologist, in addition to completing the trochus survey, conducted a special survey of many of the islands of the Marshall and Caroline Islands to determine their potential as trochus habitats in order that a subsequent trochus planting program could be organized. Various experiments were conducted in the Marine laboratory in Palau and in the field to determine optional methods whereby trochus could be transported to planting areas. Among such experiments was the introduction of trochus into remote reefs through experimental airdrops by Trust Territory aircraft.

A handbook of practical trochus management instruction written in simple English for Micronesians was also prepared by the marine biologist. This handbook <u>Trochus and You is illustrated and</u>

was designed so that it can be easily translated into the various languages of the Territory.

Experimental work in other fields of fishery work continued during the year.

Species of tilapia, first introduced from the Philippines to Guam and thence to the Trust Territory, appears to have been successfully acclimated to fresh-water pond conditions in the Territory. In the Saipan District, tilapia of mature size are now being caught by hook and line in lakes and ponds on Saipan, Tinian, Anatahan, and Pagan. In Ponape District tilapia have been successfully raised at the agricultural station and are being distributed to local people.

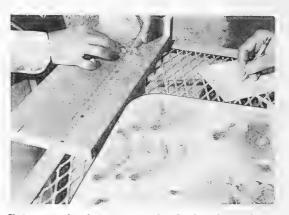
The experimental work on sea turtle culture that started during 1957 has continued. Sea turtles provide a source of food, and certain species also provide shell which is in demand for use as a local handicraft item. Experimental raising of young turtles under controlled conditions is being carried out in Ponape District and some planting of marked young turtles in outlying areas was made. (Eleventh Annual Report to the United Nations on the Administration of the Trust Territory of the Pacific Islands, July 1, 1957 to June 30, 1958.)



Panama

SHRIMP INDUSTRY:

The shrimp export business of Panama accounts for about 27 percent and ranks second to bananas in total exports. In 1958 the value of shrimp exports fell below that of 1957.



Shrimp samples being measured. On the advice of FAO fishery expert, the Government of Panama has set up a marine fishery research station where studies on the shrimp population of Panama are being carried out.

In July 1959 the Government of Panama established regulations for fishing and the export of fishery products. Both the Government and the shrimp industry (valued at about US\$8.5 million)

Panama (Contd.):

have re-examined policies and practices in the hope of assuring the continued development of the shrimp resource as a profitable enterprise. During the first seven months of 1959 catches of white shrimp continued spotty, but were better than during the similar period of 1958.

All Panamanian shrimp trawlers were fishing in Panama waters during the first seven months of this year. Due to the drop in shrimp prices in the United States market, however, prices paid the shrimp vessel owners and crews have been cut. One of the largest shrimp processing companies has installed a mechanical shrimp peeler and has also absorbed several smaller plants. The drop in shrimp prices has caused some distress to various segments of the shrimp industry. (United States Embassy dispatch from Panama, August 31, 1959.)



Poland

FISHERY LANDINGS, 1958:

Poland's fishery production during 1958 totaled 126,000 metric tons. The most important fishery product was herring caught in the North Sea which amounted to 55,000 tons. The second most important product was hake from the Baltic Sea which consisted of about 40,000 tons.

Of the total fishery landings, 95,000 tons were landed by the Government-owned fishing fleet, 16,000 tons by cooperatives, and the remaining 15,000 tons by individual fishermen.

The Polish Institute of Marine Fishery at Gdynia announced that during 1958, 22,000 persons were employed by the fishing industry and related industries. Of the total, 6,000 were actually employed as fishermen and the other 16,000 were employed on land in processing and canning plants. (Industrias Pes-

queras, Special Issue, Vigo Spain, May 15, 1959.)

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HERRING CUTTERS OPEN BASE IN BRITAIN:

The Polish herring fisheries have opened a shore base on Britain's northeast coast, at Sunderland, for t'e use of their cutter flotilla. This is part of Poland's new fish landing method known as "expeditionary fishing," by which the fleet fishing on the North Sea grounds is relieved at sea of barrels of salted herring for shipment home by base ships.

A number of British firms have been asked by Polish fishery promoters for offers to organize shore bases at one or more British east coast ports, mainly to accommodate 79-foot cutters.

The Sunderland base consists of a 650-foot quay, two warehouses with a total storage capacity for 8,000 barrels of salted herring. Another 12,000 empty barrels—or with salt—can be stored at the quay outside the warehouse; also short-term warehousing is possible for about 50,000 barrels of herring, including the services of local dockers.

It is estimated that the Sunderland base will handle about 50,000 barrels of salted herring to be re-forwarded to Poland by the end of this year.

Poland's fishing industry estimates that their landings of salt-water fish from the North Sea this year will reach about 146,000 metric tons, of which 61,000 tons will be herring.

Polish Maritime News says: "These herring catches are not high in comparison with those achieved by British, Dutch, or West German fishing fleets. This is because Polish ports are situated far from the fishing grounds, a serious disadvantage as our proportionately small fleet has to undertake long, unproductive sailing time from 3 to 5 days each way."

It explains that under the "expeditionary fishing" method the base ships also supply the fleet with provisions, fresh water, fishing equipment, empty barrels, and salt.

Taking advantage of the services by base-ships, the time which would otherwise be taken by unproductive sailing can be used for operations on the fishing grounds.

The "expeditionary fishing" in the North Sea usually lasts from the beginning of May till the beginning of December. Up to the end of June, due to the services given by a mothership and three auxiliary vessels, the herring catches in the North Sea amounted to over 16,000 tons, the paper claims. The fishing in the area for this year is for 61,000 tons of herring, the highest catches falling into the third quarter. (The Fishing News, August 28, 1959.)



Portugal

ALUMINUM DORIES TESTED IN GRAND BANKS FISHERY:

A newly-designed aluminum fishing dory or boat may replace the traditional wooden dory and change the fishing methods on vessels of the Portuguese linetrawl fleet operating in northwest Atlantic waters.

Portugal (Contd.):

The new boats are being fished experimentally by the 600-ton modern dory vessel, the Lousado. This vessel fished during the spring of 1959 on the Grand Banks and fished off Greenland during the summer.

The 75 dories which the Lousado was designed to carry were replaced this year by ten 21-foot aluminum boats, built in Bergen, Norway. Each of the new boats is powered by an 8-hp. Swedish Diesel engine and a variable-pitch propellor. They are capable of speeds up to $6\frac{1}{2}$ knots. Airtight compartments along the boat's side and at the stern give the small craft added buoyancy and safety. The boat weighs about 1,800 pounds and has a capacity for about 2,000 pounds of fish. Each is equipped with compass and oil lanterns and can fish at night if necessary.

Each boat carries two fishermen who use three metal tubs of 15 lines each, for a total length of approximately $2\frac{1}{2}$ miles. The baited line is paid out over the stern along a specially-designed chute. It is brought back over a removable roller on the side by means of a mechanical gurdy.

One of the remarkable features of the new boat is the method of handling fish. Once the fish is aboard it is kept cool and clean by means of a constant flow of sea water which is mechanically pumped in and out of the boat. A hand pump is provided for use in the event of a breakdown. Unloading the fish is another mechanical operation. The bottom of the boat is covered with a small mesh net which enables a hydraulic hoist to unload the catch in a single lift. The catch is unloaded after the boat is lifted aboard the Lousado. These boats can be launched in approximately two minutes and hoisted back, with a full load, in about three minutes.

The Lousado is the only Portuguese vessel engaged in this particular type of experimental fishing at the moment. Four trial runs have been completed and the operations of the new boats have caused the master of the Lousado to predict that the new-type fishing boat

will prove successful. The advantages are obvious ones, but principally they are those of safety and less arduous toil for the fishermen plus increased efficiency in both fishing methods and handling.

The results of this experimental fishing will be watched closely by the Portuguese fishing industry, but not more so than by the fishermen themselves, who see in the new boats a welcome change from the century-old dory operations. (Trade News, July 1959, Canadian Department of Fisheries.)

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CANNED FISH EXPORTS, JANUARY-MAY 1959:

Portugal's exports of canned fish during January-May 1959 amounted to 28,781 metric tons (1,587,000 cases), valued at US\$14.6 million as compared with 32,868 tons, valued at US\$17.1 million for the same period in 1958. Sardines in olive oil exported during the first five months of 1959 amounted to 21,247 tons, valued at US\$10.4 million.

During January-May 1959 the leading canned fish buyer was Germany with 6,569 tons (valued at US\$3.3 million), followed by Italy with 3,560 tons (valued at US\$1.9 million), Great Britain with 2,592 tons (valued at US\$1.2 million), United States with 2,531 tons (valued at US\$1.8 million), and Belgium-Luxembourg with 2,161 tons (valued at US\$1.1 million). Exports to the United States included 1,266 tons of anchovies, 52 tons of tuna, 1,156 tons of sardines, and 20 tons of mackerel. (Conservas de Peixe, July 1959.)

Portuguese Canned Fish Exports, Ja	nuary -May	1959
Species	January -N	lay 1959
	Metric	US\$
	Tons	1,000
Sardines in olive oil	21,247	10,363
Sardine & sardinelike fish in brine .	865	174
Tuna & tunalike fish in olive oil	398	642
Anchovy fillets	2,845	1,997
Mackerel in olive oil	1,823	901
Other fish	1,103	564
Total	28,781	14,641

* * * * *

CANNED FISH PACK, JANUARY-MAY 1959:

The total pack of canned fish for January-May 1959 amounted to 7,905 metric

Portugal (Contd.):

tons as compared with 8,797 tons for the same period in 1958. Canned sardines in oil (3,407 tons) accounted for 43.1 percent of the January-May 1959 total pack, down by 32.7 percent from the pack of 5,066 tons for the same period of 1958, the July 1959 Conservas de Peixe reports.

Portuguese Canned Fish Pack, Ja	muary-May	1959
Product	Net Weight	Cases
In Olive Oil:	Metric Tons	1,000
Sardines	3,407	17.9
Anchovy	2,800	279 41
Tuna	1, 145 70	3
Other species	476 7,905	24 526
Note: Values unavailable.	7,200	320

* * * * *

FISHERIES TRENDS, JANUARY-MAY 1959:

Sardine Fishing: During January-May 1959, the Portuguese fishing fleet landed 10,808 metric tons of sardines (valued at US\$1,077,638 ex-vessel or about \$99.71 a ton).

May 1959 landings of sardines totaled 5,030 tons, valued at US\$522,819. Canneries purchased 25.2 percent or 1,267 tons of the sardines (valued at US\$135,305 ex-vessel or about \$106.79 a ton) during May 1959. The balance of 3,763 tons was purchased for the fresh fish market. None was salted.

Other Fishing: The January-May 1959 landings of fish other than sardines were principally 9,189 tons of chinchards (value US\$519,619). (Conservas de Peixe, July 1959.)

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SARDINE PRODUCTION, 1958:

Sardines continued to be Portugal's leading commercial fish species during 1958. Fishermen (members of the Sardine Fishermen's Guild) landed 202,729 metric tons of sardines valued at about 440 million escudos (US\$15.3 million). The 1958 sardine landings surpassed by 19,000 tons the best catch ever recorded

previously, which was in 1941. Also, the record 1958 sardine landings were 53,000 tons greater than the average yearly amount landed during the 17-year period 1941-57.

Prices for sardines were lower in 1958 due to less demand on the part of the sardine canning industry which had accumulated stocks of canned sardines that could not be sold in 1957.

Portugal's total fishery production in 1958 attained a record high--11,000 tons higher than in 1957 which was the previous record high year. (Boletin de Informacion, Sindicato Nacional de la Pesca, Madrid, Spain, June 1959.)



Somalia

TUNA FISHERY, 1958:

There are two tuna canneries located at Candala and Abo on the Gulf of Aden in Somalia. Most of the tuna are caught by Somali commercial fishermen in the Gulf of Aden.

The estimated catch of tuna in Somalia in 1958 was about 10.7 million pounds. All types of fish and shellfish landed in Somalia amount to about 11.8 million pounds, therefore, tuna is by far the predominant species. The types of tuna caught were not reported. Besides tuna, 1 million pounds of shark were landed, and the balance consisted of blackfish, needlefish, sailfish, red snapper, spiny lobster, perch, and squid.

Fishery exports by Somalia in 1958 totaled 1.2 million pounds--mostly canned tuna and dried and salted fish (mostly tuna) shipped to Italy. But since most of the fishing is done in the Gulf of Aden, fishing vessels land some catches direct in Aden which are not reported as Somalia landings or exports. The value of Somalia's fishery exports is about US\$667,000, or 5 percent of Somalia's total exports, the United States Consul in Mogadiscio reported on August 18, 1959.



Surinam

PRODUCTION AND EXPORTS OF PROCESSED SHRIMP, 1952-58:

Shrimp production in Surinam varied from a low of 300 metric tons in 1952 to a high of 927 tons in 1958. Prior to 1956, the catch was limited to a small estuarial variety of sea bob, which was dried and used largely for local consumption.

Table		rocessed Shrimp Product 952–1958	tion,
Year	Dried Sea Bob	Frozen Pink Shrimp	Total
		. (Metric Tons)	
1958	893	34	927
1957	353	12	365
1956	730	6	736
1955	560	_	560
1954	450	_	450
1953	400	_	400
1952	300	_	300

In 1955 a shrimp processing and freezing firm was established at Paramaribo with exclusive shrimp fishing and exporting rights. With the discovery of stocks of large pink and white shrimp off the Guiana coast, the Surinam shrimp company has concentrated on processing the larger shrimp for export.

Table 2	- Surinam's Expo	orts of Shrimp,	1952-1958
Year	Quantity	Value	
	Metric Tons	Sf 1,000	US\$1,000
1958	59	154	82.9
1957	22	72	39.0
1956	47	136	72.8
1955	12	26	13.9
1954	フ	12	6.4
1953	10	14	7.5
1952	1/	1/	-
	1 ton an Sf 1,0 man florin equal		

The Surinam Fisheries Service continues to dry sea bob, some of which are exported to the Netherlands, Curacao, Puerto Rico, and other Caribbean islands. No shrimp is imported into Surinam. (United States Consulate report from Paramaribo, August 7, 1959.)



U.S.S.R.

DEVELOPMENT OF A TUNA FISHING INDUSTRY:

The development of a commercial tuna fishery for the U. S. S. R. is discussed by A. V. Mikheev, a member of

the Fisheries Division of the U. S. S. R. State Planning Authority, in the June 1959, issue of the Soviet fisheries periodical Rybnoe Khoziaistvo. The article is titled: "For a More Rapid Development of Tuna Fishing."

The article points out that in order to create the broad range of fishery products called for by the present U. S. S. R. 7-year plan, commercial exploitation of such species as tuna, sardines, and saury or mackerel pike must be developed as soon as possible. The author points out that sardine fishing by Soviet vessels in the tropical Atlantic and saury fishing in the Pacific are already on a commercial basis, but that much work remains to be done on tuna fishing, where experience so far has been on a small scale.

The present 7-year plan calls for an annual tuna catch of 200,000 centners (22.0 million pounds) by 1965. To attain this production, it is planned to build a number of specialized tuna boats to be based in the Far East for year-round tuna fishing in the Pacific, and a larger number of combination tuna boat-trawlers to be based in Baltic and Black Sea ports for seasonal tuna fishing in the tropical Atlantic.

The writer considers the various methods used for fishing tuna, and concludes that the U. S. S. R. fishing industry should concentrate first on the development of long-lining and seining, as techniques in which Soviet fishermen are more experienced. Pole-and-line fishing, because of the specialized skill which it requires and because of the difficulties associated with the use of live-bait, should be left for development at a later stage.

The article indicates that large-scale programs of exploratory and experimental fishing have been set up this year by the Kaliningrad Sovnarkhoz for the tropical Atlantic and by the Primorsk Sovnarkhoz for the Pacific.

The article indicates that the Soviet attempts to develop a tuna fishery have been attended by many difficulties so far, and states that the attempt to start off using the most complex types of tuna fishing mehtods and those least suited to Soviet conditions has had negative results and has

U. S. S. R. (Contd.):

delayed the development of the fishery. The author also stresses the need for making available materials for fishing gear, as well as building tuna boats, and states that at the present time it is difficult even to get together enough gear to equip a few exploratory fishing boats.

* * * * *

FISHERY PRODUCTION AND PROCESSING POTENTIAL BEING EXPANDED:

The Soviet Union is expanding to a considerable extent its fishery production and processing potential. Both the east and the west areas in which the fish are landed are located at great distances from the large consumption centers. Preservation on a large scale is a necessity and distribution of fish in the fresh state is almost excluded.

The difficulties have primarily been mastered through an appreciable expansion of the freezing capacity. Freezing capacity out at sea is larger than that on shore.

Russia has long experience with floating freezing factories. In 1880 they installed freezing machines on barges which were towed along the Volga from Astrakhan up that river. In a similar way, they started to utilize the fish of the river Yenisei in 1904. But present day Russia does not freeze fish only in its own waters. Through its modern freezing fleet, consisting of more than 300 units, of which some have a freezing capacity of 50 tons per 24 hours, it has become feasible to extend operations to distant waters far from their own coast.

In freezing units, designed by their own scientists and engineers, fish is frozen in slabs or blocks. Very little of the present fish catch is frozen and retail packed. After having brought the slabs to port, they are transported frozen, chiefly in railway cars, to fish-processing plants, frequently located in the areas of consumption.

Frozen fish is then defrosted and constitutes the basis for continuous

packing operations in the canning plants. Some of the fish is smoked, and no small quantities are used after defrosting for the preparation of ready-made dishes. Fried fish fillets and boiled fish in plastic bags are a couple of the major bulk items. They are currently manufactured in continuously-operating production lines. In one of the large fish combines in Moscow, each processing line had a capacity of 10 to 20 metric tons per 24 hours.

In the North Pacific naval skirmishes between the Soviet Union and Japan were frequent in the 1930's. The real reason was the struggle for fish. Russia had built floating factories which could be towed to various areas around the sea of Okhotsk. Japan, on the other hand, manoeuvred out to sea and caught the salmon before it reached the Russian rivers for spawning. The Soviet Union, since World War II restricted Japanese fishing by allowing Japan to operate only one single floating cannery in that region.

Each Russian mothership is accompanied by 50 to 60 fishing boats. These floating factories chiefly can packs of various salmon and crab, at present an important export item. In the waters around Newfoundland, Soviet Russia is further operating regularly four floating salting factories. Even these are central units which serve a great number of fishing boats.

In spite of their extensive endeavors to acquire fish for food purposes, the Soviet Union has not met its needs. The investments made are, however, so sizable that their production capacity most likely will allow an appreciable increase in the annual production of fish for a number of years. The present 7-year plan is said to anticipate a freezing capacity of approximately 9,000 metric tons (19.8 million pounds) per 24 hours-i.e. three million metric tons (6.6 billion pounds) per year, of which almost one million (2.2 billion pounds) would originate on these mobile freezing units at sea. At present Soviet Russia is supplementing its own catch by buying fish on the world market. Significant quantities are obtained from Norway, England, etc.

Traditional canning has also enjoyed very active support. Several hundred

U. S. S. R. (Contd.):

plants have been erected within the frame of the terminated 5-year plans. In the first place they have been located in the large landing ports, but quite a number of these factories have been established in places with a flourishing inland fishery. Particularly interesting are those plants located in different sections of the large Siberian rivers and their tributaries. Fish-processing units (fish combines) are being built close to or inside large cities such as Moscow and operate in the way indicated above. It is noteworthy that even in the area of canning a penetrating, aimful research program is carried on. This has resulted in a remarkably rich diversification of canned fish products -- stews or simply-cooked products. Besides the traditional fish varieties as salmon, tuna, etc., a number of other fish are put up in cans, such as cod, pike, bream, etc. The total pack of canned fish exceeds far what Canada, France, and Norway together pack. The number of canning plants is given as surpassing 190.

Quite another way to meet the fish requirements of this vast country is through the cultivation of fish in order to compensate for the declining yields of the natural waters. This has carried the Soviet Union to a leading position among the fish cultivating nations. Even if they in no way can compete with China, located in a much more favorable climate and having approximately 30 million hectares (74 million acres) of fish ponds, according to the latest information, the Russian accomplishments, nevertheless, are impressive. They now have 40,000 hectares of special fish-producing establishments and furthermore, half a million hectares of fish ponds and other waters on their sovchozes (state farms) and kolchozes (collective farms). The goal is to give each village at least one fish pond and to raise equally as much fish in this semiartificial way as in all internal waters of the Union, including the Caspian, Sea of Azow, etc. Without prejudices they have tested the most diverse fish varieties as to their productivity and reproduction. They also succeeded in mastering many difficulties in the raising of several fish varieties which earlier were not utilized for this purpose. Consequently, they do not only cultivate

carp and certain salmon fishes, but also pike, large-mouth bass, and white fish are encountered in the ponds. For an efficient productivity, the simultaneous cultivation of two different species and varying ages is practiced. To the Fish Combine in Moscow is delivered young sturgeon, half-size, from fish ponds. They come raised in a type of "broiler" production of fish. They arrive at the plant in a living condition being brought in by specially-constructed refrigerated railway cars. These sturgeon are used in the manufacturing of ready-made dishes, and cooked fish cutlets in plastic bags.

Carp is, however, the dominating crop. No less than 113,200 metric tons (249 million pounds) was raised of this single species in 1957. The average yield was 825 pounds per hectare (2.471 acres). Methods and special strains of carp have been developed which allow profitable production even at the 60th latitude north, corresponding to southern Alaska.

At the large Industrial Exhibition in Moscow could be seen this year, not only a special railway car for the transporting live fish, but there were also given detailed descriptions of various types of fish-raising ponds developed by Soviet research workers and fish technologists. There is also experimentation with transplantations. The fishes of the lake of Bajkal and of Balkash are taken to the waters in the west and conversely the fishes of the European part of Russia are tested in the east. Special mention should be made of the large-scale efforts to acclimatize fish in the lower stretches of the rivers Don and Kuban, running into the Sea of Azow. Various salmon are transplanted and bred in the Baltic and Barrents Sea. Sturgeon breeding is going on in the Caspian. They have also been successful in the crossing of several fish species--in some cases even when they were distantly related. The Government is operating more than 130 hatcheries. Approximately 2,000 billion larvae and 5,000 billion young fish are released annually.

If one compares fisheries with agriculture, it is quite evident that proportionately larger resources are put to the disposal of fisheries in the Soviet Union. This indicates that in the long run they show greater confidence in fisheries than

U. S. S. R. (Contd.):

in agriculture when it comes to providing food for the rapidly-growing population and particularly animal protein. (World Fishing, May 1959.)

Note: 1 hectare equals 2.471 acres.



United Kingdom

DISTANT-WATER TRAWLERS MAY REQUEST SUBSIDIES:

During July a member of the United Kingdom Parliament suggested the possibility of a request for subsidies for the distant-water trawling fleet. He said that the fleet at Hull was faced with many problems, including obsolete slip-



Unloading distant-water trawler at Grimsby, England. Note movable winch on dock and gangplanks on which baskets of fish slide to dock.

ways, the problem of replacement, and competition. There was the supreme problem of the 12-mile limit and the

threat voiced to bring out the limit to 100 fathoms. These "limits" problems and the cost of replacement might lead the distant-water fleet to ask the Minister for subsidies in the future. (The Fishing News, July 24, 1959.)

* * * * *

HERRING FISHERMEN PROTEST PRICE DROP:

The Scottish herring fishing fleets based at Peterhead and Fraserburgh were due to tie up about August 22 if the Herring Industries Board (HIB) implemented a decision to reduce the price of herring consigned to the meal and oil plants from 40/0 to 33/0 per cran (about 2.0 to 1.7 U. S. cents a pound). The price reduction, effective August 17, was announced when minimum prices were fixed for the season. But, claim the fishermen, the lower price in the circumstances of the present season will make fishing uneconomic. (Fish Trades Gazette, August 22, 1959.)

* * * * *

NEW FACTORYSHIP-TRAWLER COMPLETES MAIDEN TRIP:

The new factory-ship-trawler Fairtry II returned to Grimsby, England, late in July from its maiden voyage. The vessel landed 600 metric tons of fillets and whole fish, 202 tons of fish meal, and 3,600 imperial gallons of fish oil from a trip that started on April 2, 1959. Before the Fairtry II returns to sea for its second voyage, she will undergo minor modifications. The Fairtry II is a sister ship to Fairtry I which pioneered in England a new type fishing vessel that combined fishing and processing in the same hull. (The Fishing News, July 24, 1959.)





Federal Trade Commission

MARYLAND CLAM DIGGERS'ASSOCIATIONS CHARGED WITH PRICE FIXING:

Three Maryland clam diggers' associations and their officers and members were charged by the Federal Trade Commission, in a complaint dated September 13 (7578, clams), with illegally fixing and enforcing prices of clams harvested in Chesapeake Bay.

The three associations include substantially all clam diggers operating in the Bay area. All members were not specifically named as party respondents because large and fluctuating membership makes this impracticable, the complaint says.

It charges that since 1958 the associations and their members have conspired "to suppress and hinder competition between and among themselves and also between themselves and other parties in the purchase or sale" of softshell clams.

Specifically, it alleges that they have (1) established and maintained uniform and noncompetitive prices and terms for the purchase or sale of their clams; (2) boycotted dealers seeking to buy clams at less than the fixed prices; and (3) enforced adherence to their prices and terms by various methods including threats of reprisals, intimidation, and physical violence.

Respondents were granted 30 days to file answer to the complaint.

* * * * *

TWO FISHERY FIRMS DENY ILLEGAL BROKERAGE PAYMENTS:

Two Seattle fishery firms (packers of canned salmon and other seafood) and

their president and sales manager, on September 3, 1959, denied Federal Trade Commission charges of making illegal brokerage payments to favored customers (Answer 7562, Seafood).

The concerns admit selling their seafood pack to buyers throughout the country. However, they deny allegations in the Commission's August 6 complaint that they sell through primary brokers in the Seattle area and through field brokers elsewhere and that usually the former are paid a 5-percent brokerage fee and the latter a $2\frac{1}{2}$ -percent fee.

Requesting dismissal of the complaint, they flatly deny the charge that certain customers were given grants or allowances in lieu of brokerage or price-concessions reflecting brokerage, in violation of Sec. 2(c) of the amended Clayton Act.

The Commission's complaint (7562, Seafood), of August 24 charged that the concerns sell their products through primary brokers in the Seattle area and through field brokers elsewhere in the United States.

A typical method allegedly used was to give these customers or their agents price reductions which were coupled with or offset wholly or partly by reducing the broker's fee earned on the sales.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PETITION FILED FOR USE OF AN ANTIBIOTIC TO RETARD SPOILAGE OF FISH STEAKS, FILLETS, AND PEELED SHRIMP:

A petition has been filed by American Cyanamid Company, Princeton, N. J., proposing the issuance of a regulation to

establish a tolerance of 5.0 parts per million (0.0005 percent) of the antibiotic chlortetracycline hydrochloride to retard bacterial spoilage in cuts of fish, such as steaks and fillets, and in peeled shrimp. The notice of filing of petition as published by the U. S. Food and Drug Administration in the September 11 Federal Register follows:

DEPARTMENT OF HEALTH, EDU-CATION. AND WELFARE

Food and Drug Administration
[21 CFR Part 121]
FOOD ADDITIVES

Notice of Filing of Petition for Issuance of Regulation Establishing Tolerance for Chlortetracycline Hyrochloride for Use in Various Cuts of Fish and in Peeled Shrimp

Pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec. 409(b)(5), 72 Stat. 1786; 21 U.S.C. 348(b)(5)), the following notice is issued:

A petition has been filed by American Cyanamid Company, P.O. Box 383, Princeton, New Jersey, proposing the issuance of a regulation to establish a tolerance of 5.0 parts per million (0.0005 percent) of chlortetracyline hydrochloride to retard bacterial spoilage in cuts of fish, such as steaks and fillets, and in peeled shrimp.

Dated: September 8, 1959.

[SEAL]

JOHN L. HARVEY, Deputy Commissioner of Food and Drugs.

The use of chlorotetracycline on fresh-caught whole, headed, and gutted fish, shucked scallops, and unpeeled shrimp was authorized on April 21, 1959, by the Food and Drug Administration, and it was also in response to a petition by American Cyanamid Company. But cuts of fish steaks and fillets and peeled shrimp were not included in that authization.



Department of the Interior

ALASKA URGED TO HELP PROTECT SEA OTTER:

The Department of the Interior announced August 26 its legal determination that it does not now have authority to withdraw tidal and submerged lands as an addition to the Aleutian Islands National Wildlife Refuge in Alaska. Simultaneously, the Department asked that the State of Alaska take

steps to join with the Federal Government to provide complete protection for sea otters in waters adjacent to the Refuge.

Secretary Fred A. Seaton said the ruling was made in view of the extension to Alaska by the Statehood Act of provisions of the Submerged Lands Act of 1953, vesting title in the States to tidal and submerged lands within three geographical miles of their coastline.

In his letter to Governor of Alaska William A. Egan, Secretary Seaton said:

"Our biologists have made studies of the behavior of these sea otters. These studies and any other information we have on this subject will be made available to the Alaska Department of Fish and Game on request. And I assure you that we will be willing to discuss any arrangement which will lead to a cooperative management and protection program for sea otter.

"My only plea is that you consider the matter as soon as possible. I am informed that these animals constitute a resource which could, once again, prove a valuable resource with commercial possibilities if properly managed. And I feel certain that it is not only in the national interest, but also the Alaskan interest, to see that the necessary steps for such protection are taken as soon as possible."

The Department's Bureau of Sport Fisheries and Wildlife applied in October 1958 for the withdrawal



Fig. 1 - Three adult sea otters and a pup on rocks, Amchitka Is.

of "all tidelands and all adjoining areas of water extending 3 miles beyond mean low water" adjacent to the Aleutian Refuge. This application was still pending when Alaska was admitted to the Union on January 3, 1959.

The purpose of this proposed withdrawal of tidelands and submerged land was to aid the Bureau in the protection and management of the expanding sea otter population inhabiting the coastal waters of the Aleutian Refuge.

A legal opinion by the Solicitor's Office advised the Secretary that the temporary segregation of these lands under this application did not under all the prevailing circumstances transfer the areas from the jurisdiction of the Bureau of Land Management to the Bureau of Sport Fisheries and Wild-

The withdrawal may not now be made, the ruling declared, since the lands are within the areas to which the Submerged Lands Act applies, and the title to those lands has passed to the State of Alaska.

Secretary Seaton expressed the hope that Alaska will promptly take the necessary steps to protect this valuable natural resource with its potential commercial possibilities, whether such steps involve State action only or a cooperative State-Federal approach.

Sea otters once were numbered in the tens of thousands in Alaskan and North Pacific waters. During the Russian occupation of Alaska, they were the object of intense hunting because a silky black sea otter pelt was worth its weight in gold. (In 1804 a single shipment of 15,000 skins valued at more than \$1 million was made from Sitka, Alaska.) At the time the United States acquired Alaska in 1867, these valuable fur-bearing animals had been reduced to the point of commercial extinction by heavy exploitation.

Since 1910 the killing of sea otters has been outlawed, except for limited hunting by Alaska natives beyond the 3-mile limit. Sea otter protection by the Federal Government for nearly 50 years has paid off to the extent that about 30,000 of these sea mammals are now reported to live along the Alaskan and Aleutian Islands coast. A census of the animals in the Aleutian Islands area in May 1959 revealed a population of between 8,000 and 9,000 -- a very substantial increase over five years ago.

In studies carried on by the Bureau of Sport Fisheries and Wildlife, biologists have found that sea otters cannot live except along certain shorelines, in an area where the water is comparatively shallow, and where sea urchins -- their principal food--are found. Kelp beds, where they may rest, play, and hide from killer whales, are also essential to their existence.

Bureau officials are greatly encouraged over the fine increase shown by the sea otters. However, because the animals spend most of their time offshore, they feel it is vitally important to be able to give them protection in the tidal areas.

The Aleutian Islands National Wildlife Refuge was established by Executive order in 1913. The 2,720,235-acre refuge extends throughout most of the island chain. It provides habitat for Emperor geese, ducks, sea birds, ptarmigans, brown bear, and caribou in addition to sea otters.

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FISH AND WILDLIFE SERVICE

Bureau of Sport Fisheries and Wildlife

INTERSTATE TRANSPORTATION OF UNLAWFULLY-CAUGHT LIVE FISH PROHIBITED:

Federal and state fish and wildlife agencies now have been armed with

stronger enforcement weapons to combat interstate transportation of illegallycaught game fish, the U.S. Department of the Interior reported September 15,

Steps are now being taken to use the new authority provided by a recent amendment to the "Black Bass Act." The amendment was approved by President Eisenhower on August 25, and became effective immediately.

Officials of the Bureau of Sport Fisheries and Wildlife, declare that it gives them the legal authority to halt a practice which is creating serious problems for state conservation agencies.

Federal and state conservation officials supported the amendment because of the growing practice by some groups of fishermen to net game fish unlawfully in one state, and sell them to feepond operators in another state. The new law, which not only covers the transporting but also the buying, selling, and possessing of unlawfully-caught live fish, gives the Federal Government authority to cooperate with the respective states in protecting their fisheries resources.

The Black Bass Act was passed in 1926 to halt interstate commercialization of a popular sport fish. Later it was extended to include all fish, except steelhead trout caught in the Columbia River between the States of Oregon and Washington. In those days the farm pond, and especially the fee pond, did not create an appreciable market for live game fish; thus, provision was not made in the original Act to include live fish or eggs.

Interstate Commerce Commission

RAILWAY EXPRESS AGENCY PER-MITTED TO INCREASE LCL RATES:

The Interstate Commerce Commission voted to allow the Railway Express Agency to put higher rates into effect September 1 on less-than-carload shipments.

The rate increases vary from 25 to 35 cents per 100 pounds and apply only to less than carload shipments. The overall increase is about 6 percent, but on short hauls the percentage increase is considerably greater. For example, a rate of \$1.00 per 100 pounds increases to \$1.25 or \$1.35, which is a 25- or 35-percent increase. A rate of \$3.50 goes to \$3.75 or \$3.85, which means an increase of 9 or 10 percent.

The amounts of the increases are (1) 35¢ per hundred pounds between points within the Eastern territory and between points within the Mountain Pacific territory, minimum of 35¢ per shipment, and (2) 25¢ per hundred pounds, 25¢ minimum per shipment, between all other points.



Treasury Department

BUREAU OF CUSTOMS

DECISION CLASSIFIES PET FOOD CONTAINING 50 PERCENT FISH AS MIXED FEED:

The Bureau of Customs, U. S. Treasury Department, in a letter dated June 19, rendered the following decision--T. D. 54885(18):

Pet Food, canned, consisting of 50 percent fish, 30 percent water, and 20 percent corn grain products, salt, vitamins, and preservative, is classifiable as a mixed feed consisting of an admixture of grains or grain products with molasses, oil cake, oil-cake meal, or other feedstuffs under paragraph 730, Tariff Act of 1930.

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FOREIGN ASSETS CONTROL DIVISION

IMPORTS OF SHRIMP FROM HONG KONG PROHIBITED:

The Foreign Assets Control Division of the U. S. Treasury Department has found it necessary to stop shrimp imports from Hong Kong. This action is due to the fact that shrimp produced in Red China has been coming into the United States through Hong Kong. The Treasury Department is developing a new procedure in cooperation with the

Hong Kong Government. Until a satisfactory precedure can be developed all shrimp imports from Hong Kong are prohibited.



White House

UNITED STATES MEMBER APPOINTED TO INTERNATIONAL PACIFIC HALIBUT COMMISSION:

The White House on August 26, 1959 announced the appointment of Andrew W. Anderson as a United States member of the International Pacific Halibut Com-



Andrew W. Anderson

mission. Anderson, Assistant Director of the U. S. Bureau of Commercial Fisheries, succeeds Seton H. Thompson, who is now the Gulf and South Atlantic Regional Director with headquarters in St. Petersburg Beach, Fla.

In 1930 Anderson joined the old U.S. Bureau of Fisheries as a statistician in Washington, D. C. The next step was his assignment as a Fishery Technologist at Gloucester, Mass., and Seattle, Wash. Later he was assigned the position of Chief of Market News, the Unit that is responsible for the daily Fishery Market News Reports. In 1943 he was named Chief of the Branch of Commercial Fisheries in the U.S. Fish and Wildlife Service. After the Service was reorganized into two Bureaus, he was appointed Assistant Director of the U.S. Bureau of Commercial Fisheries, which position he continues to occupy.

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Eighty-Sixth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the



fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate,

as well as signature into law or other final disposition are covered.

CONGRESS ADJOURNS: The first session of the 86th Congress adjourned sine die on September 15, 1959. The second session will convene January 6, 1960. All legislation before either the Senate or House will remain in its status as of adjournment and will be subject to further consideration upon the convening of the second session. Bills that were introduced in the first session do not have to be reintroduced. Bills that were reported out of a committee or passed by one body of the Congress remain in status quo and do not have to again retrace their legislative steps.

BIOLOGICAL MARINE LIFE STUDIES: H. R. 9273 (Bonner), a bill to provide for a study of biological marine life in certain parts of the Atlantic and Pacific Oceans reasonably proximate to the Panama Canal and Central America; to the Committee on Merchant Marine and Fisheries; introduced in House September 14. Provides authorization for the Panama Canal Company to make a complete detailed study of the biological marine life, together with an oceanographic study with reference to the normal occurrence of such marine life. The bill further provides authority to place contracts for the performance of any part of the studies with qualified private organizations or on a cooperative and reimbursable basis with certain departments, agencies, or instrumentalities of the United States, for which studies there is authorized to be appropriated to the Panama Canal Company such sums as may be necessary to carry out the provisions of the Act.

COAST GUARD TRANSFER: H. R. 9214 (Bowles), a bill transferring the U. S. Coast Guard from the Treasury Department to the Department of Commerce; to the Committee on Merchant Marine and Fisheries; introduced in House September 11.

COLUMBIA RIVER FISHERIES INVESTIGA-TIONS: Both Houses of Congress on September 8 passed without amendment H. R. 9105, Public Works Appropriation, 1960 Fiscal, which action cleared the bill for the President.

The President September 9 vetoed H. R. 9105 and returned the bill to Congress (H. Doc. No. 226).

In his veto message the President cited that H. R. 9105, was identical to previously vetoed H. R. 7509 in all respects (including the 67 unbudgeted projects), except that each individual project and appropriation item had been reduced by $2\frac{1}{2}$ percent. In that Congress had failed to meet any of the objections outlined in the previous veto message to accompany H. R. 7509, and since a reduction of appropriations for individual items and projects might have the effect of impeding orderly work on going projects, the President returned the bill without approval with a recommendation to the Congress to enact a continuing resolution, effective until January 31, 1960, so that work in progress could proceed in an orderly way.

House and Senate September 10, on reconsideration, passed H. R. 9105 over the President's veto and the bill became law (P. L. 86-254). Included in the appropriation are funds for the Corps of Army Engineers and Bureau of Reclamation for water resources development, management, construction, and investigation programs including certain Columbia River Projects.

FEDERAL BOATING ACT OF 1958 AMEND-MENT: Senate September 9 passed with amendment and sent back to the House H. R. 8728, to extend until January 1, 1961, the effective date of certain provisions of the Federal Boating Act (S. Rept. 875). Senate amendment would extend the effective date to April 1, 1961. The Federal Boating Act of 1958 included provisions for establishment of a new system of numbering small undocumented vessels propelled by machinery of 10 or more horsepower, using the navigable waters of the United States, and provided that the new system administered by the Coast Guard would go into effect April 1, 1960. The legislation is designed to provide the additional time required to put the new numbering system into effect and for Congress to authorize the necessary appropriation to carry out the provisions of the law, as amended.

Senate Report No. 875, Extending to April 1, 1961, the Effective Date of Certain Provisions of the Federal Boating Act of 1958 (September 2, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce to accompany S. 2598), 3 pp., printed. Contains the purpose and provisions of the bill, Committee recommendations, and changes in existing law.

House September 11 concurred in Senate amendments and cleared H. R. 8728 for the President.

President September 21 announced that approval of H. R. 8728 was being withheld. The action constituted a pocket veto of the bill.

In the memorandum of disapproval, the President cited that the legislation was originally considered necessary because it had not been possible to obtain a supplemental appropriation for the Coast Guard to administer the new system. Since Congress passed the bill, however, the funds required for the implementation of the Federal Boating Act have been included in the Mutual Security Appropriation Act, 1960. The extension of time provided in the bill therefore was considered to be no longer needed.

FISHING VESSEL CONSTRUCTION SUBSIDIES: Senate September 11 passed H. R. 5421, providing for a program of assistance to correct inequities in the construction of fishing vessels, after amendment by substitution of text of companion bill S. 2578, in which the Senate requests the concurrence of the House. Amendment provides for inclusion of defense features not contained in House bill and authorizes to be appropriated for the 3-year program up to \$5 million annually, as compared to the \$1 million annual appropriations provided by the House. House took no action prior to adjournment. Bill to be placed on calendar for next session of Congress.

FISHING VESSEL MORTGAGE INSURANCE FUND: Senate September 11 passed without amendment and referred to the House S. 2481, continuing the application of the Merchant Marine Act to certain functions transferred to the Secretary of the Interior relating to fishing vessels. House took no action prior to adjournment.

INSECTICIDES EFFECT UPON FISH AND WILDLIFE: Senate September 10 concurred in House amendment to and cleared for the President S. 1575, authorizing continued studies on the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife. The House amendment in which the Senate concurred provides for annual appropriations of \$2,565,000 be authorized to carry out the provisions of the Act.

President September 16 signed into law S. 1575, authorizing continued studies on the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife (P. L. 86-279).

MARINE GAME FISH RESEARCH: Senate Committee on Interstate and Foreign Commerce, in executive session on September 9, ordered favorably reported H. R. 5004, directing the Secretary of the Interior to make a continuing study of migratory game fish (S. Rept. 987).

Senate Report No. 987, Authorizing and Directing the Secretary of the Interior to Undertake Continuing Research on the Biology Fluctuations, Status, and Statistics of the Migratory Marine Species of Game Fish of the United States and Contiguous Waters (September 9, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce to accompany H. R. 5004. . . .), 3 pp., printed. Contains the purpose and provisions of the bill, committee recommendations, and departmental report.

Senate September 11 passed H. R. 5004, without amendment, and cleared the bill for the President.

President September 22 signed into law H. R. 5004, providing for a continuing marine gamefish research program, and authorizing to be appropriated not more than \$2,700,000 annually to carry out the provisions of the Act (P. L. 86-359).

OCEANOGRAPHY: S. 2692 (Magnuson and 10 other Senators), a bill to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys; to promote commerce and navigation, to secure the national defense; to expand ocean resources; to authorize the construction of research and survey

ships and facilities; to assure systematic studies of effects of radioactive materials in marine environments; to enhance the general welfare and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate September 11. The bill, titled "The Marine Sciences and Research Act of 1959" provides for a 10-year program relating to objectives expressed in Senate Resolution 136, introduced June 22 and adopted by Senate July 15, 1959, in regards to oceanography and the report of the Committee on Oceanography to the President.

OYSTER INDUSTRY ASSISTANCE: Senate Committee on Interstate and Foreign Commerce, in executive session on September 9, ordered favorably reported S. 2632, to assist the States of New Jersey and Delaware in developing a strain of oysters resistant to causes which threaten the oyster industry on the east coast (S. Rept. 985).

Senate Report No. 985, Assistance to Delaware-New Jersey Oyster Industry (September 9, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interstate and Foreign Commerce to accompany S. 2632. . . .), 3 pp., printed. Contains the purpose and provisions of the bill, correspondence from sponsors of the legislation, committee recommendations, and estimate of the cost of the program.

Senate September 11 passed <u>S. 2632</u> without amendment and referred the bill to the House. House took no action prior to adjournment of Congress.

SHRIMP IMPORT DUTIES: H. R. 9274 (Bonner), a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimps and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quota; to the Committee on Ways and Means; introduced in House September 14. Identical to H.R. 8769 and related bills previously introduced which provide for duties and quotas on shrimp importations to protect the domestic industry and for other purposes.

SMALL BUSINESS ACT AMENDMENT: Senate September 10 passed with amendment in which the Senate requested the concurrence of the House H. R. 8599, to amend in several respects the Small Business Act. The amendment provides that certain funds are to remain available for grants for research and management counseling during fiscal year 1960. The legislation provides the additional funds necessary to operate the Small Business Administration's regular business loan program over the recess, into 1960, and provides authority for appropriations to continue the programs of grants for studies, research, and counseling concerning the management, financing, and operation of small business enterprises.

House September 11 concurred in Senate amendments and cleared $\underline{H},\ \underline{R},\ 8599$ for the President.

President September 22 signed into law \underline{H} , \underline{R} . $\underline{8599}$, to increase the loan authority of the Small Business Administration from \$500 to \$700 million (P. L. 86-367).

SMALL BUSINESS INVESTMENT ACT OF 1958
AMENDMENT: The Senate September 10 passed without amendment and cleared for the House S. 2611, amendments to the Small Business Investment Act. The legislation is designed to liberalize the kind of investments which small investment companies may make so as to encourage the formation of small business investment companies. House took no action prior to adjournment.

TREATIES ON THE LAW OF THE SEA: The President September 8, 1959, signed the conventions adopted at the Conference of the Law of the Sea held at Geneva, Switzerland, last April.

The President September 9 transmitted to the Senate for ratification five treaties formulated at the United Nations Conference (1) Convention on the Territorial Sea and the Contiguous Zone, (2) Convention on the High Seas, (3) Convention on Fishing and Conservation of Living Resources of the High Seas, (4) Convention on the Continental Shelf, and (5) Optional Protocol of the Signature Concerning the Compulsory Settlement of Disputes; together with accompanying documents and a report of the Acting Secretary of State; referred to the Committee on Interstate and Foreign Commerce.

The treaties reached the Senate after the Committee had concluded meetings for the 1st session

of the 86th Congress, and it is unlikely that another meeting will be held before Congress reconvenes in January. Prompt action is expected when the Congress reconvenes. The 4 conventions adopted at the Conference of the Law of the Sea at Geneva, Switzerland, last April were signed by President Eisenhower on Tuesday, September 8.

WATER POLLUTION STUDIES: H. J. Res. 522 (Reuss), a House Joint Resolution directing the Secretary of Health, Education, and Welfare to conduct certain studies and investigations relating to water pollution, and for other purposes; referred to the Committee on Public Works; introduced in House September 8. Provides for a number of studies of water pollution, including (1) the effects of disposing of nuclear wastes in the ocean as well as in the navigable waters of the United States; and (2) methods of controlling water pollution caused by the disposition of sewage and garbage from ships operating in the navigable waters of the United States. Further provides that, based upon such investigations and studies, uniform laws be formulated for possible enactment by States and political subdivisions to prevent water pollution, and to submit to Congress proposals for any Federal legislation necessary to correct any water pollution problem revealed by such studies and investigations.



THE FISHING BOAT OF 1975

Delegates to the Second World Fishing Boat Congress had a look into the future when, at one session, they discussed the fishing boat of 1975. At the 1953 Congress, states a preamble to this discussion, there was a paper about gasturbine propulsion of fishing-boats, and a number of papers on factoryship design. Many participants felt that it was too early to take up such subjects.

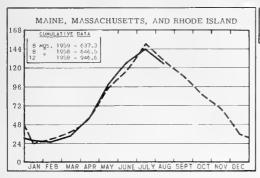
Now, however, gas-turbine trawlers have been put into operation, and dozens of huge factoryships are operating successfully in waters not before known to the fishing industry. Development in fishing-craft design will not slow down but, on the contrary, will accelerate as technical progress continues. The time might not be very far ahead when the first atomic-powered fishing craft will operate. Similarly, with the advance of stern trawling, stabilizers might soon be introduced to make working conditions for the crew much more comfortable.

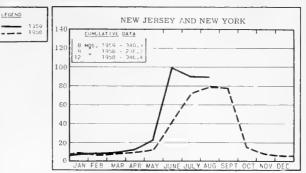
With progress in automation, fishing boats might be designed to operate with much smaller crews. It might even be possible to send large factoryships to the fishing ground, manned by a skeleton crew, and, when needed, send out the main working crew by supersonic planes. The fishing craft of the future might even be airborne with adjustable jets to keep them stationary or at low speed when fishing, and then flying with their catch direct to consumption centers far inland: (The South African Shipping News and Fishing Industry Review, May 1959.)

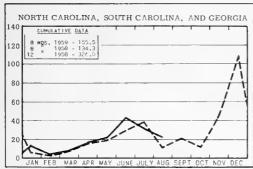


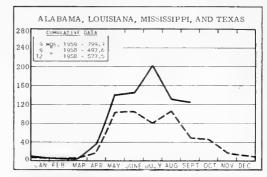
CHART I - FISHERY LANDINGS for SELECTED STATES

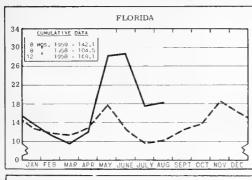
In Millions of Pounds

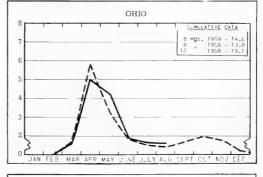


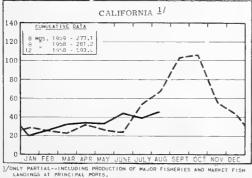












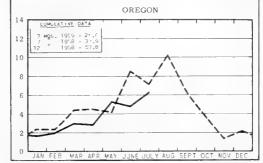
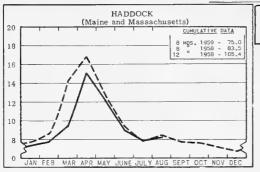
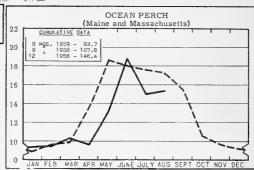


CHART 2 - LANDINGS for SELECTED FISHERIES

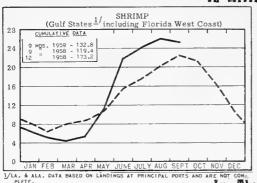


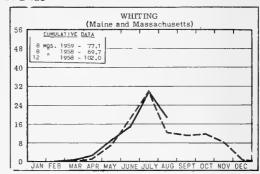
LEGEND:



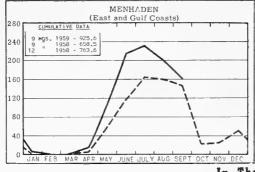


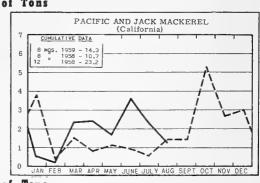
In Millions of Pounds



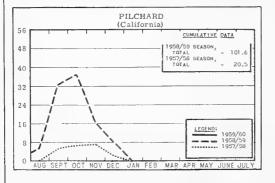


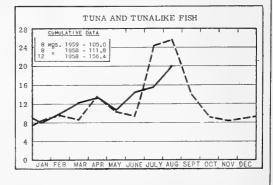
PLETE. In Thousands of Tons

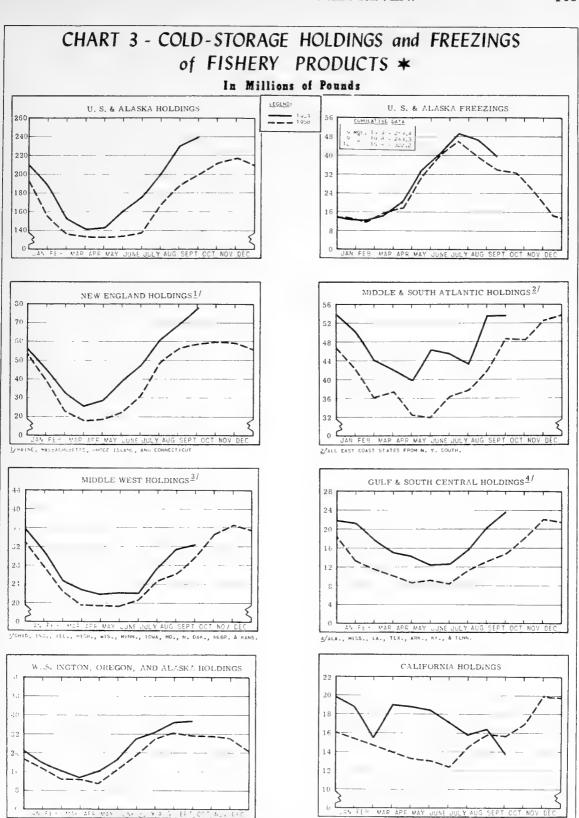




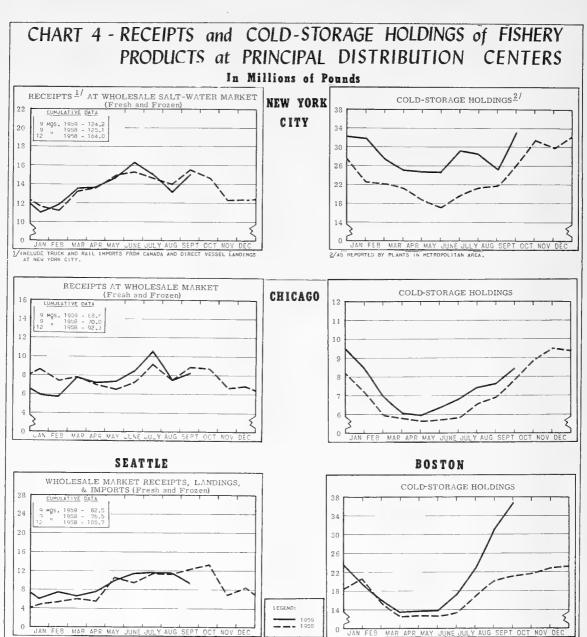
In Thousands of Tons







* Excludes salted, cured, and smoked products.



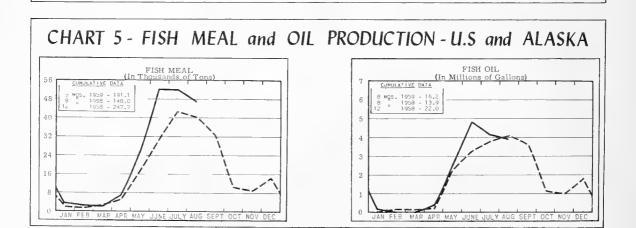
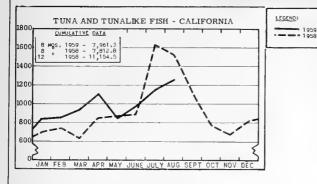
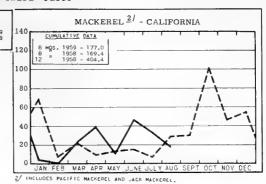
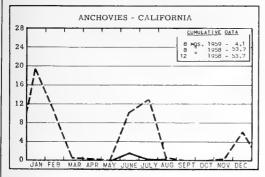


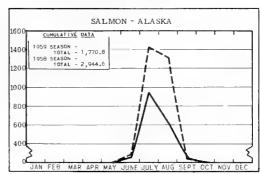
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

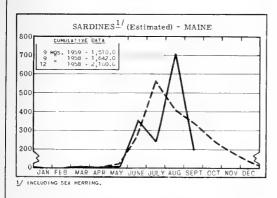
In Thousands of Standard Cases



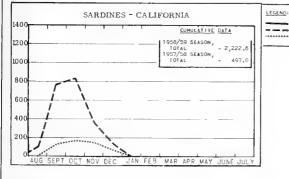








Variety			
variety	No. Cans	Designation	Net Wg
SARDINES	100	drawn drawn	3 3 oz
SHRIMP	48		5 oz
TUNA	48	# ½ tuna 6	&7 oz
PILCHARDS	48	# 1 oval	15 oz.
SALMON	48	1~lb, tall	16 oz.
ANCHOVIES	48	½ -1b.	8 oz.



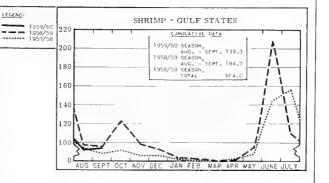
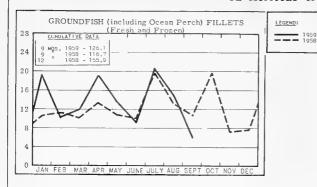
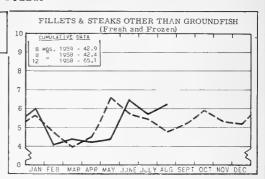
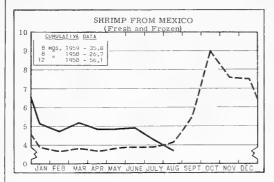


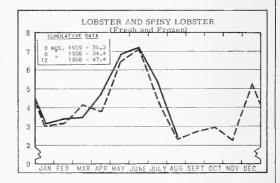
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

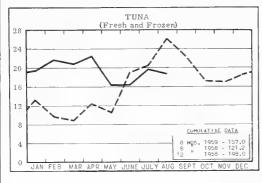
In Millions of Pounds

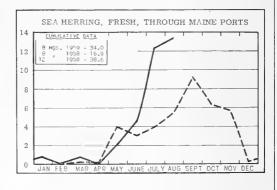


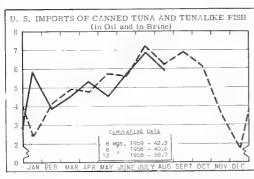


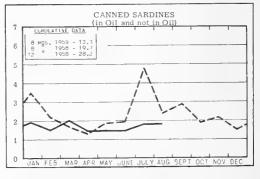














FISH AND WILDLIFE SERVICE **PUBLICATIONS**

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.

FL - FISHERY LEAFLETS.

SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SSR.- FISH. SPECIAL SCIENTIFIC REPORTS.-FISHERIES (LIMITED DISTRIBUTION).

SEP,- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Number Title CFS-2087 - Texas Landings, May 1959, 3 pp.

CFS-2088 - Frozen Fish Report, June 1959, 8 pp. CFS-2089 - Shrimp Landings, March 1959, 6 pp.

CFS-2094 - Alabama Landings, April 1959, 2 pp. CFS-2098 - Rhode Island Landings, April 1959, 3 pp. CFS-2101 - Fish Meal and Oil, June 1959, 2 pp.

CFS-2102 - North Carolina Landings, June 1959,

3 pp.

CFS-2103 - Georgia Landings, June 1959, 2 pp. CFS-2104 - New Jersey Landings, June 1959, 3 pp. CFS-2105 - South Carolina Landings, June 1959,

2 pp.

CFS-2106 - Shrimp Landings, April 1959, 6 pp. CFS-2107 - Florida Landings, June 1959, 7 pp.

CFS-2108 - Frozen Fish Report, July 1959, 8 pp.

CFS-2109 - Maine Landings, June 1959, 3 pp. CFS-2112 - Fish Sticks and Portions, April-June

1959, 3 pp. CFS-2113 - Massachusetts Landings, May 1959,

5 pp. CFS-2117 - Rhode Island Landings, May 1959, 3 pp.

CFS-2122 - Texas Landings, June 1959, 3 pp.

CFS-2131 - Louisiana Landings, 1958 Annual Summary, 4 pp.

CFS-2135 - Rhode Island Landings, June 1959, 3 pp.

FL-449 - Organizations and Officials Concerned with the Commercial Fisheries, 1959, 19 pp.

FL-478h - Canned Fish Consumer Purchases by Family Characteristics (October 1958-March 1959), 53 pp., illus., August 1959.

This information is collected as part of a broad marketing research program directed toward improving and expanding the canned tuna, salmon, and sardine markets. It is projected from a nationwide consumer panel of approximately 6,000 families representing 22,000 persons. The data represent estimated purchases of canned fish by household consumers only. This report summarizes data on household consumer purchases of canned tuna, salmon, and sardines for the 6 months

period, October 1958-March 1959. It is developed from data appearing in the current series of monthly reports entitled Canned Fish Consumer Purchases. The data are based on reports covering 26 full weeks, whereas monthly data are derived from reports covering 4-week periods. The purpose of this report is to provide additional information concerning buying practices of households as related to regions, city-size locations, and other socio-economic factors.

Wholesale Dealers in Fishery Products, 1959 (Revised):

SL-6-New York Coastal Area. SL-24-Minnesota (Lakes Area).

SL-34 - Wisconsin (Mississippi River and Tributaries).

SL-36 - Iowa (Mississippi River and Tributaries).

SSR-Fish. No. 298 - Leading Adult Squawfish (Ptychocheilus oregonensis) Within an Electric Field, by Galen H. Maxfield, Kenneth L. Liscom, and Robert H. Lander, 19 pp., illus., April 1959.

Sep. No. 562 - Effect of Radiation Pasteurization on the Storage Life and Acceptability of Some North Atlantic Fish.

Sep. No. 563 - Observations on Trawl-Door Spread and a Discussion of Influencing Factors.

Sep. No. 564 - Research in Service Laboratories (October 1959): Contains these articles -- "Possible Atomic Energy Commission Assistance of Research on Radiation Preservation of Fish, "Optimum Level of Menhaden Fish Meal and Solubles as Sources of Growth Factors in Broiler Diets," "Supplementary Effect of Fish Meal and Fish Solubles in Chick Diets," "Fish Meal as a Source of Unknown Growth Factor and High-Quality Protein," "Feed Formulation Utilizing a High-Speed Digital Computer," and "Gas Chromatographic Studies of Fish Spoilage."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, July 1959, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina

and Maryland, August 1959, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

- New England Fisheries--Monthly Summary, July 1959, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; coldstorage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.
- Progress Report on Alaska Fisheries Management and Research, 1958, 34 pp., illus., processed. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Juneau, Alaska.) Describes the accomplishments of the Alaska Region of the Bureau of Commercial Fisheries during 1958. The report is divided into two parts: the first part presents highlights of 1958 Alaska salmon fishery; the second reviews the marine fisheries. It presents information and statistical data on the salmon fisheries of Southeastern Alaska, Yakutat, Copper River-Bering River, Yakataga, Prince William Sound, Cook Inlet, Kodiak, Chignik, Alaska Peninsula, Bristol Bay, and Yukon River and Arctic Area. The review of the marine fisheries describes the fisheries for herring, crab, shrimp, and clam. A table is also included showing the salmon pack for 1958 by area.
- (Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1959, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION. WRITE TO U.S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, FISHERY BIOLOGICAL LABORATORY, HONOLULU, HAWAII, FOR INFORMATION.

Fishing Ground of Goshumagro (Australian Bluefin) and the Fishing Grounds of Bigeye and Yellowfin in the Eastern Equatorial Sea Area, by Tadao Kamimura, 7 pp., processed, translated from Japanese. (Reprinted from Tuna Fishing, No. 53, October 1958, pp. 27-32.)

- On Estimating Tuna Fishing Conditions in the North Pacific Ocean, by Akira Suda, 7 pp., processed, translated from Japanese. (Reprinted from Tuna Fishing, no. 64, November 10, 1958, pp. 27-31.)
- On the Mechanism of Variation in Water Temperature and Chlorinity of Upper Layer in the Seas Southwest off Kyushu and Around Nansei-Shoto, by Nobue Watanabe, translation from Japanese, 13 pp., illus., processed. (Reprinted from Bulletin of Tokai Regional Fisheries Research Laboratory, no. 21, August 1958, pp. 15-24.)
- The Operating Conditions of Japanese Tuna Long-Liner Boats, Sea Currents and the Fishing Condition of Yellowfin and Albacore in the Equatorial Waters of the Atlantic Ocean, by Nagai, Nakagome, Kobayashi, and Shimosato, 8 pp., processed, translated from Japanese. (Reprinted from Tuna Fishing, no. 57, 1959, pp. 21-24.)
- On the Ovaries of the Skipjack, KATSUWONUS
 PELAMIS (Linnaeus), Captured in the Fishing
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- On the Stomach Contents of the Skipjack, KATSU-WONUS PELAMIS, by Hideyuki Hotta and Toru Ogawa, translation from Japanese, 30 pp., illus., processed. (Reprinted from Bulletin of Tohoku Regional Research Laboratory, no. 4, March 1955, pp. 62-82.)
- A Study of Spawning of Skipjack in the Satsunan Sea Area, by Hiroshi Yabe, 25 pp., illus., processed, translated from Japanese. (Reprinted from Contributions of Fisheries Experimental Station, no. 115, 18 pp.)

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM, CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AGAR:

"Studies on the Antisepsis of Agar During the Manufacturing Process in the Mild Winter. II—On the Physicochemical Changes of Agar and its Intermediate Product, 'Tokoroten' in the Spoilage," by Kiroaki Fujusawa and Terutake Sukegawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, 1957, pp. 306-314, illus., printed in Japanese with English abstract, figures, and tables. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

ALMANAC:

The Nautical Almanac for the Year 1960, 276 pp., illus., printed, \$2. Department of Defense,

Washington 25, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

ANTIBIOTICS:

Antibiotics in Food Preservation, by Neil Tomlinson, Studies 1957 from the Stations of the Fisheries Research Board of Canada, FRB No. 505, printed. Fisheries Research Board of Canada, Ottawa, Canada.

ANTIOXIDANTS:

"Comparative Study of a Few Commercial Antioxidants," by Charles Pacquot and J. Mercier, article, Journal of the American Oil Chemists' Society, vol. 36, February 1959, pp. 20-21, printed. American Oil Chemists Society, 35 E. Wacker Drive, Chicago 1, Ill.

BIOCHEMISTRY:

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Queen's Printer and Controller of Stationery, Ottawa, Canada.

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Thermal Copolymerization of Amino Acids to a Product Resembling Protein, by Sidney W. Fox, and Kaoru Harada, 1 p., illus., printed. (Reprinted from Science, vol. 128, no. 3333, November 14, 1958, p. 1214.) Oceanographic Institute and Chemistry Department, Florida State University, Tallahassee, Fla.

BIOLOGICAL RESEARCH:

Preliminary Report BROWN BEAR Cruise 144
off the Washington, Oregon, and Northern California Coasts, 18 July to 31 August 1956, by
Herbert F. Frolander and John H. Lincoln with a section on "Geological Observation," by
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University of Washington, Department of Oceanography, Seattle 5, Wash., November 1956.

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"A Revised Check List of the Freshwater and Anadromous Fishes of California," by Leo Shapovalov, William A. Dill, and Almo J. Cordone, article, California Fish and Game, vol. 45, no. 3, July 1959, pp. 159-180, printed. California Department of Fish and Game, 722 Capital Ave., Sacramento 14, Calif.

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British Columbia Salmon Spawning Report - 1958, 15 pp., processed. Department of Fisheries, 110 Georgia Street West, Vancouver 5, B. C., Canada, March 17, 1959.

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"Study Ecology and Food Habits of the Chubs (Leucichthys sp.) and Their Relation to the Ecology of Lake Michigan," by Silvestre V. Bersamin, article, Papers of the Michigan Academy of Science, Arts, and Letters, vol. 43, part 1, 1958, pp. 107-118, printed. Papers of the Michigan Academy of Science, Arts, and Letters, The University of Michigan Press, Ann Arbor, Mich.

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"Rost i Vozrast GluboKovodnykh Ryb" (Age and Growth of Deep-Sea Fish), by E. B. Kulikova, article, Akademiia Nauk SSSR. Institut Okeanologii, vol. 20, 1957, pp. 347-355, printed in Russian. Akademii Nauk SSSR. Institut Okeanologii, Trudy., Moscow, U. S. S. R.

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"Quick-Freeze Factory Trawler 'Fairtry II'," article, Modern Refrigeration and Air Control News, vol. 62, no. 733, April 1959, p. 374, illus., printed. Modern Refrigeration and Air Control News, Maclaren House, 131 Great Suffolk Street, London S. E. 1, England. Describes the New Fairtry II (sistership of the revolutionary Fairtry I), which was launched early this year in England.

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Fairtry" Factory Fishing Fleet, supplement to Fishing News, no. 2401, April 24, 1959, 28 pp., illus., printed. Fishing News, Suite 27, 110 Fleet St., London, E. C. 4, England. A supplement devoted to articles concerning factory trawlers. Includes articles on "Famous Shipping and Whaling Company Pioneers Modern Factory Trawler"; "Fairtry Story is Told"; "How Problems Were Met and Improvements Made"; "Skipper Romyn Sums up His Experiences on Fairtry and Gives Frank Comment"; "Builders Give Full Technical Details of the New Fairtrys"; "Fairtry II Equipped with Diesel-Electric for Powering"; "Simons of Renfrew Have Specialized for Nearly a Century in Complicated 'Working' Ships"; "The Shipyard that Crossed the Atlantic"; "Extra Fish Meal Capacity Will Win More Money"; "Fish Factory Enlarged to Handle 30 Tons of Fish a Day"; "Special Log Gives Sensitive Accuracy in Speed and Distance"; "Fine Range of Equipment Provided to Find the Fish"; "Good Pay and Conditions Attract Good Men"; "Marketing on Merit Achieved Deserved Success"; and "Sound Refrigeration Ensures a Fine Product."

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Fish Flour: An Account of Its Properties by the Fishing Industry Research Institute, Cape Town, Memorandum No. 89, July 1958, 3 pp., printed. The Fishing Industry Research Institute, University of Cape Town, Rondebosch, C. P., Union of South Africa.

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"The Self-Heating of Fish Meal," by G. M. Dreosti and A. N. Rowan, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, pp. 26-28, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

FISH OIL:

"Preparation of a Coating Material By Chlorination of Fish Oil. III-On the Fire-Retardant Property of the Product," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, nos. 6 and 7, 1958, pp. 515-518, illus., printed in Japanese with English abstract, figures, and table. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

FLORIDA:

A Data Report of Florida Gulf Coast Cruises, by Frank Chew, S. J. Bein, and J. H. G. Stimson, 122 pp., illus., printed. The Marine Laboratory, University of Miami, Miami 49, Fla. Contains hydrographic and chemical data collected during the 8 major cruises sponsored by the Florida State Board of Conservation during the two-year period beginning July 1955.

FOOD AND AGRICULTURE ORGANIZATION:

Catalogue of FAO Fisheries Publications, compiled by Patricia M. Andrews, FAO/59/4/3186, May 1959, 17 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Lists periodicals; FAO fisheries studies; papers; separate publications; publications of the General Fisheries Council for the Mediterranean, Indo-Pacific Fisheries Council, and Latin American Fisheries Training Centers; reports on the Expanded Technical Assistance Program; and reprints.

Food and Agriculture Legislation, vol. VII, no. 1, 1958, Ceylon, XVI.2/57.1, 2 pp., printed, \$1. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.

A Standard Terminology and Notation for Fishery Dynamics, by S. J. Holt, J. A. Gulland, C. Taylor, and S. Kurita, FAO/59/5/3817, 4 pp., printed. (Reprinted from Journal du Conseil International pour l'Exploration de la Mer, vol. 24, 1959, pp. 239-242.) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. In view of the rapid increase in publications dealing with various aspects of fishery dynamics, the need was recognized at the Special Meeting held by the Research and Statistics Committee of the International Commission for the Northwest Atlantic Fisheries at Biarritz in March 1956, for standardization of the mathematical symbols for the most commonly used quantities. The basis for discussion was a review prepared by Gulland (1956, 1958); a system of notation was proposed, and provisionally accepted by the Commission at the 1956 Annual Meeting for use in its publications. After some deliberation, the 45th Statutory Meeting of the International Council for the Exploration of the Sea at Bergen in 1957 recommended the adoption by its member countries of the notation as finally amended. English is the basic language of the terminology but equivalents in German and Japanese were also accepted.

FOOD SPOILAGE:

The Effect of Several Antifungal Antibiotics on the Growth of Common Food Spoilage Fungi," by John B. Klis, Lloyd D. Witter, and Z. John Ordahl, article, Food Technology, vol. 13, February 1959, pp. 124-128, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

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The Technology of Food Preservation, by Norman W. Desrosier, 431 pp., illus., printed. The Avi Publishing Co., Inc., Westport, Conn., 1959. A textbook which presents the elements of the technology of food preservation. It contains chapters on: food to preserve; acceptable food to eat; refrigerated storage of perishable commodities; food freezing; principles of food preservation by drying, canning, fermentation and pickling; and preservation of food as sugar concentrates, with chemical additives, and with ionizing radiation. Sections on fish cover canned fish, chemical preservation, cold storage, dehydration, and salting. A suggested reading list is presented at the end of each chapter which greatly expands each of the major subject areas. Also, an appendix contains a list of journals which cover the topics of the text.

FROZEN FOODS:

"Ultrasonic Defrosting of Frozen Foods," by A. L. Brody, article, Food Technology, vol. 13, February 1959, pp. 109-112, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

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Ananiadis, 4 pp., processed, translated from the Greek. (Reprinted from Alieia, vol. 12, no. 134, August 1958, pp. 41-42.) Not for general distribution; on deposit at the Central Library, Department of the Interior, Washington 25, D. C.

On the Nature of Production in the Sea, D. H.
Cushing, Fishery Investigations, series 2, vol.
22, no. 6, 43 pp., illus., printed, 10 s. (US\$1.40).
Her Majesty's Stationery Office, York House,
Kingsway, London W. C. 2, England, 1959.

GREAT LAKES:

Fishes of the Great Lakes Region, by Carl L.

Hubbs and Karl F. Lagler, Bulletin No. 26, 269
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"The Content of Fat and Fat-Free Dry Matter in Winter Herring During the Years 1930-1956,"

- by Einar Flood, article, Fiskeridirektoratets Skrifter Serie Teknologiske Undersøkelser, vol. 3, no. 5, 1958, pp. 1-9, printed in Norwegian. Director of Fisheries, Bergen, Norway.
- "Fatness of Small Herring in the Bay of Fundy," by A. H. Leim, article, Journal of the Fisheries Research Board of Canada, vol. 15, November 1958, pp. 1259-1267, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer and Controller of Stationery, Ottawa, Canada.
- Oil and Cattle Food from Herrings, by Severin Sirnes, U.S. Patent 2, 832, 684, April 29, 1958, printed. U.S. Patent Office, Washington 25, D.C.
- Sildarrannsoknir AEGIS Sumarid 1954 (Herring Investigations with the Research Vessel Aegir in the Summer 1954), by Jon Jonsson and Unnsteinn Stefansson, Fjolrit Fiskideildar Nr. 5, 42 pp., illus., processed in Icelandic with English summary. The University Research Institute, Department of Fisheries, Reykjavík, Iceland, 1955.

IMPORTS:

United States Imports of Merchandise for Consumption (Commodity by Country of Origin), Calendar Year 1958, Report No. FT 110, 168 pp., processed, \$1. Bureau of the Census, U. S. Department of Commerce, Washington, D. C., July 1959. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The import statistics include government as well as nongovernment shipments of merchandise (including fish and shellfish and fishery byproducts) from foreign countries to the United States.

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Journal of the Faculty of Fisheries, Prefectural University of Mie, vol. 2, no. 3, 125 pp., illus., printed in Japanese with English summary. Otanimachi, Tsu, Mie Prefecture, Japan, October 25, 1957. Contains "Study on the Small Trawl Net," by Chihiro Miyazaki.

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"The Geneva Conference on the Law of the Sea and the Right of Innocent Passage Through the Gulf of Aqaba," by Leo Gross, article, The American Journal of International Law, vol. 53, no. 3, July 1959, pp. 564-594, printed. Executive Secretary, The American Society of International Law, 1826 Jefferson Place, N. W., Washington 6, D. C.

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Abundance, Distribution, and Mortality of Jack Mackerel, Trachurus symmetricus, Eggs and Larvae, by David Allen Farris, article, Dissertation Abstracts, vol. 19, no. 2, 1958, p. 391, printed. University Microfilms, University of Michigan, 313 No. 1st St., Ann Arbor, Mich.

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Some Marine Algae from Mauritius, by F. Børgesen, Final Part, Biologiske Meddelelser Danske Videnskabernes Selskab, Bind 23, no. 4, 34 pp., illus., printed. Ejnar Munksgaard, Publishers, 6 Norregade, Copenhaven K, Denmark, 1957.

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Marine Borer Investigations (Submitted April 1958 to Bureau of Yards and Docks), U. S. Department of the Navy, Contract NOy-81879, Annual Report, January 1958 to December 1958, 47 pp., Illus., processed. The Marine Laboratory, University of Miami, #1 Richenbacker Causeway, Miami 49, Fla.

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Marine Resources, by Milner B. Schaefer and Roger Revelle, 37 pp., illus., printed. (Reprinted from Natural Resources, 1959, pp. 73-109.) Scripps Institution of Oceanography, La Jolla, Calif. The existing and latent resources of the sea are many and varied; their rational development and utilization offer a technical, economic, and social challenge. This report considers some of these resources and some of the problems that need to be solved to make full use of them. Subjects covered include: nature of marine resources; kinds of marine resourcesliving resources, petroleum and natural gas under the continental shelves, minerals on the sea floor and in the water, ocean transportation and defense, waste disposal, recreation, and water from the sea; some problems in the development of marine resources -- increasing the harvest of marine food resources, conservation of the living resources of the sea, legal and economic problems, international problems, and domestic conflicts over the utilization of resources.

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With One Unsecured Rope, by B. A. Popov, Miscellaneous series, no. 181, translated from Russian, 22 pp., processed. Ministry of Agriculture, Fisheries and Food Fisheries Laboratory, Lowestoft, England.

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The Fishes of the New Guinea Region, by IanS. R. Munro, Fisheries Bulletin No. 1, 274 pp., printed. (Reprinted from the Papua and New Guinea Agricultural Journal, vol. 10, no. 4, pp. 97-369.)

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consist of a series of morning lectures (to be printed in book form shortly after the Congress) and concurrent afternoon seminars. This volume of summaries in English, with abstracts in a second language, follows the five general topics of the Congress-History of the Oceans, Populations of the Sea, The Deep Sea, Boundaries of the Sea, and Cycles of Organic and Inorganic Substances in the Sea.

The Primary External Water Masses of the Tasman and Coral Seas, by D. J. Rochford, Division of Fisheries and Oceanography Technical Paper No. 7, 29 pp., illus., printed. Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, 1959.

OUTBOARD MOTORS:

Outboards at Work, by William H. Taylor, 58 pp., illus., printed. Outboard Marine International S. A., Nassau, Bahamas. An attractively illustrated booklet with many photographs showing the use of outboard motors for boats in many parts of the world. A chapter on commercial fishing with outboard motor-powered vessels describes: fishing for salmon, catfish, shrimp, scallops, clams, shad, and oysters in selected areas of the United States; fishing in Lake Maracaibo, Venezuela; and an FAO report on increased fishery production brought about by the use of motors in fishing craft.

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Bar, Apalachicola Bay, Florida, by R. Winston
Menzel, Neil C. Hulings and Ralph R. Hathaway,
6 pp., processed. (Reprinted from Proceedings
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Studies of the Distribution and Feeding Habits of Some Oyster Predators in Alligator Harbor, Florida, by R. Winston Menzel and Fred E. Nichy, vol. 8, no. 2, June, 1958, 21 pp., illus., printed. The Marine Laboratory, University of Miami, Miami 49, Fla.

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"The Incidence of Nematodes in the Fillets of Small Cod from Lockeport, Nova Scotia, and the Southwestern Gulf of St. Lawrence," by D. M. Scott and W. R. Martin, article, Journal of the Fisheries Research Board of Canada, vol. 16, March 1959, pp. 213-221, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer and Controller of Stationery, Ottawa, Canada.

A New Species of Parasitic Copepod of the Family Lernaeidae, LERNAEENICUS MULTILOBATUS, from a Deep-Sea Angler Fish, by Alan G. Lewis, 5 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 2, June 1959, pp. 169-173.) The Marine Laboratory, University of Miami, Miami 49, Fla.

Studies on the Trematode Parasites Encysted in Florida Mullets, by Robert F. Hutton & Frank-

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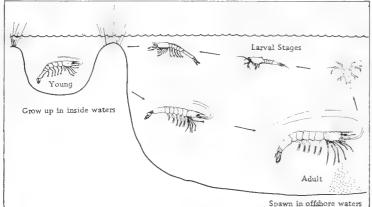
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THE BAIT SHRIMP INDUSTRY OF THE GULF OF MEXICO

Fishery Leaflet 480, The <u>Bait Shrimp Industry of the Gulf of Mexico</u>, describes the fishing gear used by bait fishermen, the methods of operation, and the marketing practices in Texas and Florida. In other areas of the Gulf, marketing practices may differ considerably, but fishing gear methods of operation are similar.

Live shrimp is the preferred bait for sea trout, redfish, flounders and most game fish of the bays and inshore waters of the Gulf of Mexico. The use of shrimp for this purpose has given rise to



a large bait industry in some areas. Approximately 39 million shrimp with a retail value of \$500,000 were utilized by the bait industry in northeast Florida during a 12month period in 1952-53. The bait catch on the west coast of Florida in 1955 amounted to almost 59 million shrimp with a retail value of nearly \$2 million. In Galveston Bay, Tex., over 252,000 pounds of shrimp retailed at almost \$292,000 from June 1957 through May 1958. It is apparent that catching shrimp for bait is an important industry in the Gulf States.

The bait fishery is based on three kinds of shrimp, also used. The kind that predominates varies

as food: the white shrimp, the brown shrimp, and the pink shrimp. The kind that predominates varies according to locality and time of year.

On the northeast coast of Florida, the bait fishery north of New Smyrna is dependent on white shrimp, and that from New Smyrna to Fort Pierce is based on brown and pink shrimp. On the west coast of Florida from Cedar Key to Naples, the catch is chiefly pink shrimp.

In Galveston Bay on the Texas coast, brown shrimp dominate the bait catch from May through the middle of July, white shrimp from August through April. Pink shrimp occur infrequently.

Other shrimp that occasionally enter the bait fishery include the sea bob and the broken-neck shrimp. In some areas, after periods of heavy rainfall, fresh-water river shrimp enter the bays and are utilized by the bait fishery. Several species of grass shrimp are numerous along the marshes of inshore waters and are commonly mistaken for the



Fig. 1 - Holding pen made from cypress slats of perforated fiberboard and is suspended in the water. Water exchange is by means of natural currents and tidal movements. The pens can be raised by a simple but effective winch arrangement.

young of commercial varieties of shrimp. Although grass shrimp are very hardy, they seldom exceed 2 inches in total length, and are not used to any extent by the bait fishery.

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Vol. 21, No.12

DECEMBER

FISH and WILDLIFE SERVICE United States Department of the Interior Washington, D.C.

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE ARNIE J. SUOMELA, COMMISSIONER

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF INDUSTRIAL RESEARCH
AND SERVICES

HAROLD E. CROWTHER, CHIEF



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, May 21, 1957.

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SECOND WORLD FISHING BOAT CONGRESS

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INTRODUCTION

The second World Fishing Boat Congress, arranged by the Food and Agriculture Organization of the United Nations, convened at FAO's Headquarters in Rome April 5-10, 1959. Fifty technical papers were presented and a total of 293 participants from 35 countries registered. The representation was: Austria 1; Belgium 4; Canada 6; Costa Rica 1; Cuba 1; Denmark 6; Dominican Republic 1; Finland 4; France 31; Germany

16; Ghana 1; Greece 1; Iceland 1; India 1; Ireland 4; Israel 3; Italy 70; Japan 10; Korea 2; Libya 1; Mexico 1; Morocco 5; Netherlands 17; Norway 10; Pakistan 1; Philippines 1; Poland 5; Portugal 2; Spain 3; Sweden 10; Switzerland 5; Tunisia 1; United Kingdom 42; United States 19; U.S.S.R. 4. In addition, representatives of the General Fisheries Council for the Mediterranean and the International Labor Office attended.

The theme of the Congress, PERFORMANCE, was divided into four main subjects: Tactics, Construction, Sea Behavior, and Productivity. These were discussed at separate sessions for which an annotated program out-



Fig. 1 - The opening session of the Second World Fishing Boat Congress held at FAO headquarters in Rome.

lined the background of the subjects and those to receive special attention at each session.

The discussion on tactical methods was split into sessions on fishing methods and deck arrangement, and command of operations. These sessions started with brief introductions of their papers by five authors on drift-netting, gill-net fishing, long-line fishing, pole-and-line fishing, and trawling.

The subject of construction was divided into sections on scantlings, new materials, fish holds, installation of machinery, and costs of construction.

The session on fish holds aroused much interest, and opinions were expressed that naval architects so far had not cooperated enough with fishery technologists in developing simple and economical installations. Various freezing methods such as brine, air blast, contact and tunnel freezers came up for deliberation.

At the session on installation of machinery, not individual engine designs as such but the installation of machinery in general was discussed. Special attention was given to a paper on vibration, and there was much debate on the relative merits of controllable pitch propellers and multiple reduction gears. A United States paper, in the section on costs of construction, gave an analysis of dimensions, weights, and costs of United Statesbuilt fishing vessels, but it was emphasized that construction costs are lower in Europe.

Sea behavior was divided into sessions on resistance and propulsion, seakindliness, stability, and safety at sea. The discussion revealed the importance of determining the true operating speed of fishing vessels in order to select their most efficient proportions and shape. Participants also dealt with the advantages and disadvantages of bulbous bows and transom sterns. Suggestions were again made that FAO should continue its work on minimum stability, and the Dutch delegate explained that his Government had great confidence in the Rahola criteria.

On productivity there was a symposium on boat types and a session on the choice of size and type and the fishing boat of 1975. At the symposium, many new types of boats were described, and in the choice of size and type session, the disadvantages and advantages of factoryship operation were thoroughly examined. A Japanese representative reviewed Japanese work on developing two large fishing vessels for atomic propulsion at the session on the fishing boat of 1975.

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Part I - Observations of a United States Government Fishery Methods and Equipment Specialist

Stewart Springer*

ACCOMPLISHMENTS OF THE FISHING BOAT CONGRESS: It is obviously important to bring about better understanding of the problems of fishing vessel operators by architects, and equally important to get operators to take optimum advantage of the services naval architects can give. In practice, the naval architect must work within very narrow limits in the design of fishing vessels. Investors in new vessels are notably reluctant to authorize changes of design or to risk the very severe economic penalties for failure of a new design to give over-all performance as good as obtained from tried and proved designs. There is, consequently, little opportunity to get operational tests of designs incorporating radical departures from conventional practice. Most new fishing vessels have some new but minor changes in the hull or equipment, and undoubtedly most of these are actually beneficial and produce better performance. But this permits only a slow evolution in design under a rigorous economic selection. Without occasional radical mutation this leads to dead ends. New materials, more compact and reliable power sources, and increasingly comprehensive information on performance characteristics of certain hull designs have given the naval architect wide opportunity to make changes.

At the same time, the investor in a new fishing vessel has to consider the ever-changing requirements of the market for fishery products, as well as the general competitive situation. It seems probable that there is not only the opportunity but also the need for occasional major change. The kind of change which may result from agreement of owner and architect is illustrated by the development of the stern-chute trawler. The meeting at Rome brought together for discussion the problems of operation and the problems of construction. We may properly, I think, be hopeful that the results will be good and far-reaching.

The theme of the congress was performance, with papers grouped under the headings: tactics; construction, sea behavior, and productivity. Papers relating to *Chief, Branch of Exploratory Fishing and Gear Research, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, Washington, D. C.

construction and sea behavior were given somewhat more time than the others, perhaps because it is in these areas that naval architects make their principal contributions.

Experts appeared to be in agreement that there were many papers of technical excellence presented at the meeting and that the Congress was a valuable source of new ideas.

TECHNICAL PROCEEDINGS OF THE CONGRESS: Because papers and comments on them will be published later, no attempt will be made here to highlight specific points made in presentations. Such observations as can be made on overall accomplishments of the congress are necessarily personal conclusions of the writer.

Although the opening speech at the congress exhorted participants to use the imaginative approach, the discussions followed the course inevitable in scientific and technical meetings where new ideas, if any, are always roughly treated. Costs of construction, maintenance, and operation were factors entering discussions of most of the papers and the tenor of the meeting was toward the practical and conservative point of view.

There were many references to the relative merits of stern trawling and side trawling without much agreement on the part of speakers as to the efficiency or desirability of the stern trawler. Proponents of the type continue, however, to plan and build additions to the growing fleet of long-range stern trawlers. The questions concerning their merits may, thus, eventually be determined by large-scale competition.

Problems of the quality of fish arising from the need for long trips were discussed. As usual in such an exchange of views, where personal taste preferences are concerned, there was some reluctance to accept modern trends. In spite of this, some speakers pointed out that use of frozen-food products is increasing and that a wider application of freezing-at-sea methods is inevitable. Such a view seemed to be generally acceptable, provided wide use of freezing techniques could be brought about slowly. Most discussions of the question indicated that the costs for new equipment and the risks of incorrect diagnosis of the marketing trends make major moves in this direction financially hazardous for the owner-operator of fishing vessels.

Papers on specific design problems, on model testing, and on engineering problems relating to propulsion appeared to be more fruitful, although difficult for the observer not trained in naval architecture to understand, or, at the present time, to assess. Operators and builders should find some of these contributions useful in reducing construction costs and producing more efficient vessels.

The meeting was dominated, verbally at least, by persons interested in the larger and more complex vessels, and more particularly in the distant-water trawlers of the North Atlantic. Nevertheless, a number of the papers were aimed at problems of small vessels and should be especially interesting to the builders and operators of those vessels.

Two written discussions of an imaginative nature were introduced. One was an examination by Professor Takagi of Japan of the feasibility of atomic-powered factory trawlers. The other, by Lee Alverson and Peter Schmidt of Seattle, presented a preliminary design with an offset deckhouse for small stern trawlers, in an attempt to provide more deck space.

TRENDS IN WORLD FISHERIES REFLECTED BY THE CONGRESS: A growing need for making fishing more attractive as an inducement to capable young men to become fishermen was recognized in several of the presentations. The importance

of making vessels more habitable, more seakindly, and safer was stressed. Fortunately these aims are reasonably compatible with the need to make large fishing vessels more efficient. Improvements in small inshore vessels are probably equally important, but were not discussed as thoroughly. Since fishing vessels are becoming more complex, and even the smaller vessels are becoming loaded with equipment, the training of young men as fishermen was recognized as an important activity of the future.

The trend toward expansion of production by fishing in distant waters, and the use of more modern equipment, was brought out in discussions of stern trawlers, freezing-at-sea, and factoryship operations. While not spelled out specifically, it probably would have appeared to an observer with no previous knowledge of the fisheries, that technological improvements are resented by the fishing industry. This, of course, has some basis in fact. The world fishing industry is not ready to adopt or adapt all of the tools that modern technology can supply. The cost of change or innovation in the fishing fleets is not the only deterrent. An assortment of more or less related questions were present, by implication, in the discussions on the floor and in informal conversations outside the meeting.

Members of the fishing industry and fishery biologists have found some comfort in the thought, whether they subscribe to it or not, that economic forces will prevent the drastic overfishing of stocks of oceanic demersal and pelagic fishes because such overfishing is not profitable. The new element in the world fishing picture which seems to be causing concern is the intensified international competition by fleets which are subsidized in one way or another and are thus relieved of some economic limitations. It may be argued particularly that factoryship fleets concentrate very heavy fishing pressure on a limited area, moving to another only after the first has been swept relatively clean. Whether this constitutes a real threat to the world's stocks of the more desirable kinds of fishes has not received a great amount of attention from fisheries scientists. Solutions to conservation problems, particularly those which would give fishing interests a reasonably clear determination of the maximum sustainable yield by species and area, would remove some of the fears fishing vessel operators hold about the future.

Several speakers warned builders of vessels that consumers would not continue to tolerate or accept fish kept overlong on ice. Attention was called to the increasing quantities of packaged frozen foods coming into competition with fishery products. Also noted, was evidence of a change in preference on the part of consumers toward the properly frozen product. The fishing industry is in the early stages of a transition to the modern system under which the product is necessarily subject to standardized controls for quality at several points from catching to retail distribution. This is in contrast with the old system where one individual could at least follow and exert some influence on the handling methods from the time of capture to the delivery to the consumer.

The dilemma facing operators of fishing vessels making long trips involves the choice between making the change to freezing-at-sea methods now or waiting for more favorable conditions. One solution proposed on the basis of recent German experience provides for freezing equipment to handle the first portion of the catch, with icing facilities to handle that portion of the catch taken at the end of the trip.

Throughout the meetings it was apparent from discussions that distant-water fishing and near-water fishing present entirely different kinds of problems. Separation of these would have made the discussions more easily understood. A line of separation could not be precise, but a definition of distant-water fishing as that requiring more than five days absence from port might serve.

It goes without saying that the fishing vessel operator wants low-cost operation and a product that can be marketed favorably. The discussions of the congress indi-

cated that the operator recognizes the need for more comfort and safety for the crews, facilities for landing a product of sufficiently high and uniform quality to meet the new market demands, and vessels of greater efficiency in particular fisheries. At the same time the fishing industry is not able to support large-scale experimentation in design of vessels.

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Part II - Observations of a United States Government Fishery Technologist

By Joseph W. Slavin*

INSTALLATION OF MACHINERY: This part II is concerned only with the discussions of vessel design and operation that may be of interest to fishery technologists. Some notes are also included on personal discussions with fishery technologists, engineers, and naval architects. At this session papers were presented on the various aspects of the design and operation of steam, Diesel, and Diesel-electric engines. Some information was also given on the use of variable-pitch propellers.

Hopwood and Mewse in their paper on a comparison of steam- and Diesel-driven trawlers point out that the use of Diesel results in more space for storage of the fish, less fuel consumption, less maintenance, and more efficient fishing. It was most interesting to learn that many of the fishing vessels used in foreign countries are still driven by steam rather than Diesel engines; this is particularly true in the United Kingdom and Germany.

Some discussion was given to the efficiency of Diesel-electric propulsion as compared to Diesel. Gueroult of France remarked that Diesel-electric propulsion offers the advantages of ease of maneuverability and the use of compact high-speed engines. His observation was that the fuel consumption with Diesel-electric is higher than for a Diesel engine. Hunter of England stated that with Diesel-electric propulsion more efficient use could be made of the generators; thus the over-all fuel consumption is slightly less than that for Diesel engines. There was however no question about the superiority of Diesel-electric propulsion for factoryships where a lot of auxiliary machinery is required. This type of propulsion equipment should be given serious consideration in designing a freezing-fish-at-sea vessel. Heinsohn of Germany mentioned briefly that the free-piston engine being used on one of the German stern trawlers is lower in efficiency than Diesel engines. However, some bugs still have to be taken out of this machinery. The free-piston engine is a relatively new development and should be watched closely.

It was also mentioned that the use of variable-pitch propellers on fishing vessels is increasing. On the medium and small trawlers a variable-pitch propeller offers the advantage of increased speed, whereas on a larger vessel its use will result in increased efficiency during trawling. In this connection Dwight Simpson mentioned that he is designing two new fishing trawlers, about 100 feet long, for Boston fishing interests. Both of the vessels will be equipped with variable-pitch propellers.

STERN TRAWLING: Heinsohn in his paper on "Design Studies for Stern Trawlers" stated that there are no appreciable differences between the cost of constructing stern trawlers and conventional trawlers, provided the vessels are over 180 feet long. For smaller vessels stern trawlers are more costly. He recommended that on small stern-trawling vessels the engineroom be located forward to provide a large enough chute for hauling up the net. This means that the propeller shaft must run through the fish hold, generally an undesirable arrangement. Heinsohn later in a private discussion expressed the opinion that stern trawling can be satisfactorily applied to a 150-foot vessel. About the only disadvantage of this method of fishing is the difficulty in getting the net free if it hangs up on some obstruction while fishing. This however is not a major problem and can be dealt with through experience.

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The comments received on stern trawling were both favorable and unfavorable to this method of fishing, with the former being in the majority. Captain Glanville of Ireland stated that stern trawling will permit more productivity, greater safety at sea, and ease of handling; it is a must for the future. In complete agreement was Soublin of France who made a trip on a Russian stern-trawler factoryship. He mentioned that the technique of stern trawling on Soviet trawlers is well perfected from every point of view; it results in increased production, good-quality fish, and enables the crew to work under better conditions. Soublin, however, questioned the principle of this method of fishing since it may eventually contribute to depletion of many fishery resources. This latter point was also stressed during the Congress by other contributors. In other comments on this subject, Takahashi of Japan mentioned that they had constructed a 7,500-gross-ton stern-trawler and freezer vessel. However, some difficulty in operation was encountered because of the short length of the chute. It was interesting to learn that the size of the winches (60 to 90 hp.) used for stern trawling were the same as those used for conventional trawlers. A similar opinion regarding winch size was expressed by Cardoso of Portugal. He mentioned that his Government is building an experimental stern trawler to encourage industry to adopt this practice.

In opposition to stern trawling, Fred Parkes commented that he did not think the Germans were too pleased with this method of fishing. He seemed to be of the opinion that this method still has to be proven in many respects, especially for the smaller vessels. Hunter of England was also somewhat doubtful about the merits of stern trawling. He thought the chute to be a safety hazard and was concerned about the loss of space in crew's quarters due to the use of the chute.

In conclusion, the advantages of stern trawling apparently outnumber the disadvantages. Serious consideration should, however, be given to the use of a door to block off the chute and prevent fishermen from getting washed overboard when handling the trawl wire.

In this connection an English firm has designed a 100-foot stern trawler that does not require a chute for hauling up the net. I visited the office of this firm during my trip through England and saw movies of the operation of a model of this device. Briefly, the gear employed consists of a hydraulically-operated boom located at the stern of the vessel. This boom is moved vertically through a 90-degree arc as may be necessary to let out and take in both the net and the trawl doors.

PRODUCTIVITY: In the paper on "Modern Refrigerated Factory Ships in Japan," it was pointed out that ten factoryships have been built in Japan since 1953. They are used principally for salmon fishing and whale catching. The vessels are equipped with modern conveyors, refrigeration machinery, quick-freezing equipment, cooling equipment for refrigeration of the cargo holds, and canning equipment. Each catcher fleet usually employs two refrigerated factoryships and one unrefrigerated factoryship. In the Northern Pacific Ocean, for salmon fishing, about 30 catcher boats (50 to 80 gross tons each) are assigned to one refrigerated factoryships to provide refrigeration. Cold calcium-chloride brine flowing through steel-pipe coil grids is used to refrigerate the hold to a temperature of 0° to -4° F. Freezing is usually accomplished in a special shelf-freezer in which brine is circulated. In this process the fish are pressed between the metal shelves and the shelves lowered into the cold brine. After 5 to 6 hours the shelves are raised and the slabs of fish are removed to cold storage.

In introducing the paper on "Choice of Boat Type and Size for Polish Deep-Sea Fisheries," Orszulak mentioned that four types of fishing vessels should be considered for the Polish fisheries. Three of these would be stern trawlers consisting of (1) a processing-freezing vessel of about 1,000 tons, (2) a freezer vessel of 1,000 tons, and (3) a smaller vessel of 550 tons for salted herring. The fourth vessel would be a side-fishing trawler of about 550 tons for catching herring for salting. The factors that should be considered in selecting a fishing vessel are (1) size of

catches, (2) method of preservation, (3) distance to and from the fishing grounds, and (4) time that the vessel is required to stay at sea. In concluding, the speaker mentioned that a new processing-freezer stern trawler (similar to the Russian stern trawlers) is now under construction in Poland. This is the first vessel of this type to be built in Poland. I understand that in all about 45 of these vessels will be built in Poland in the near future. Later, in response to a question on Polish factory vessels, Orszulak stated that one of these new freezer trawlers will handle 50 tons of raw fish a day. Each vessel will have 3 filleting lines, one for white fish longer than 70 centimeters (28 inches), one for ocean perch, and one for filleting white fish smaller than 70 centimeters (28 inches). The vessel will also be equipped with a liver-oil plant, fish-oil plant, and a fish-meal plant having a capacity of 25 tons per day. The Polish factory trawlers will use ammonia-compression refrigeration systems and calcium-chloride brine systems for cooling the fish holds. Of particular interest is the observation that one Polish or Russian factoryship of this size could, during a year (280 fishing days), catch over 28 million pounds of fish.

Eddie, in a resume of his paper on "Propulsion and Processing Machinery for Deep-Sea Trawlers," stated that the Torry Research Station has become interested in this subject in connection with the economic aspects of freezing fish at sea. He pointed out that many trawlers are now operating at high speeds so they can spend as much time on the fishing grounds as possible and spend a minimum amount of time "steaming." However, if freezing at sea is employed instead of icing, the vessel can stay on the fishing grounds as long as possible. Therefore, it is not necessary that freezer trawlers operate at high speeds. Thus a savings can be made in the costs of operating the propulsion machinery of freezer trawlers over that of the cost of operating the propulsion machinery of conventional trawlers. In this connection, Eddie pointed out that a 15-knot British icing trawler spends an average of 160 days a year on the fishing grounds, whereas a 13.5-knot part freezer-icing trawler would spend about 180 days a year on the fishing grounds. Thus an increase in fishing time would also result, in addition to decreased fuel costs for propulsion equipment. This is a very important point and represents a fresh approach to the problem of reducing the over-all vessel operating costs associated with freezing fish at sea. Eddie, however, in his analyses did not determine the increase in cost resulting from the operation of freezing equipment as opposed to the purchase of ice. He did mention, however, that British investigators have found that very little extension of keeping quality is obtained by using antibiotic ice. Thus the use of antibiotics on fishing vessels will not result in an appreciable increase in the time that the vessel can spend on the fishing grounds.

There was a lively discussion of the papers presented at this session. The first contribution was a discussion by the Soviet Union on the operation of their factory vessels. They mentioned that Russian stern-trawling factory vessels have been in operation since 1955 and that the operation of these vessels is quite satisfactory. The products produced on these vessels consist of frozen eviscerated fish, frozen fish fillets, and byproducts such as fish meal and oil. The livers of cod are also saved. The productivity of these freezer trawlers is 60 percent higher than conventional trawlers; also the operating costs are 18 percent less than conventional trawlers. It was also stated that more research on preservation of fish is needed to find a method that will make it possible to transport considerable quantities of fish without freezing them. Improvements in vessel design are necessary to overcome stability problems and permit successful use of refrigerated sea water on long-distance vessels. The Russian presentation seemed to be a fair appraisal of factoryship operation, and to be of considerable interest to the group. There is no question that this type of operation will result in quite a change in the world fisheries picture in future years.

Birkhoff of Germany mentioned that he doubts that factory trawlers are economical because of the low price received for frozen fish and the high labor costs

associated with handling frozen fish at sea. There would be more chance of economic success by having a factory vessel act as a mothership and receive the catch from smaller trawlers, rather than using the factory vessel as the catching vessel. An economic appraisal of the operation of factory trawlers and motherships would be very interesting. Also in regard to factoryships, Harper Gow, who has an interest in the vessels Fairtry I and Fairtry II, gave an account of the development of those vessels. He mentioned that the Fairtry I has completed about four trips per year in the past four years. The operation of this vessel was so satisfactory that they built the <u>Fairtry II</u> which, while essentially the same as the <u>Fairtry I</u>, does contain some improvements designed to solve some of the problems that were found in operating the first vessel. These consist of minor modifications in the stern-trawling gear and chute to prevent the gear from catching in the propeller, enlarged facilities for filleting the fish, and equipment for producing larger quantities of fish meal and oil. In this type of an operation the production of fish meal and oil often spells the difference between profit and loss. It was mentioned that in spite of the increased labor costs it is better to land the majority of the catch as frozen packaged fillets rather than as eviscerated fish, frozen in block form. About 75 percent of the fish caught by the "Fairtry" vessels are now being filleted and frozen on the vessel. The remainder are being frozen as eviscerated fish in block form, or are being processed into fish meal and oil. Each "Fairtry" vessel has 4 to 5 filleting machines and a crew of 80 men to operate the processing equipment.

Gow also mentioned that at first personnel problems almost resulted in termination of this venture, but incentive payments and liberal vacation plans ended these problems. There is one other relatively minor problem in stern fishing; namely, the difficulty in hauling large catches aboard the vessel. It is extremely difficult to "split the bag" as is done on conventional side-fishing trawlers. He believes that it will be possible to solve this problem in the near future.

Eddie, in his discussion, agreed that new vessels should be used for freezing fish at sea; present vessels cannot be satisfactorily converted for this purpose. He also mentioned that at the Torry Research Station they have found that fish can be satisfactorily frozen, thawed, and re-frozen without any loss of quality. Also fish can be satisfactorily frozen in a pre-rigor condition. British and United States investigators are now in substantial agreement on many aspects of freezing of fish at sea. In fact the Torry Research Station is having a new freezer-trawler designed by a naval architect. This trawler will use vertical plate freezers to freeze eviscerated cod in blocks. The fish will be stored at -20° F. in the vessel's hold.

In summary, in this session on productivity it was pointed out that factory freezing vessels are meeting with considerable success in many countries. There is, however, a serious question of whether these vessels will be suitable for all countries; economic and political factors within individual countries will largely determine the appropriateness of operation of these vessels.

ATOMIC FISHING BOAT OF THE FUTURE: A somewhat speculative paper on the possible design of a Japanese atomic fishing vessel was presented by Takagi of Japan. It pointed out that Japan now has 157,000 powered fishing vessels using coal or oil. It will in the near future be necessary for these vessels to go farther and farther away from port to fully utilize their hold capacity. Tagaki stated that in many cases the limited fuel capacity restricts the cruising radius of these boats. Atomic propulsion would enable the vessels (motherships) to cruise for several years at a time unloading fish to large carrier vessels or at other ports of the world.

Japan would like to put an atomic power plant of 8,000 hp. on a 285-foot long oceanographic research vessel. This vessel would have rooms for over 1,000 people. They also have in mind the outfitting of a smaller 5,000-gross-ton training ship with an atomic power plant. This vessel would be used for training students in

oceanography. In concluding, Takagi mentioned that proposals for outfitting the aforementioned vessels with atomic power are being considered by the Japanese Government. He hopes that these projects, if approved and successfully carried out, will provide a basis for the construction of atomic-powered fishing vessels in Japan.

NOTES ON PERSONAL DISCUSSIONS: Much valuable information was received as a result of conversations with naval architects, engineers and fishery technologists attending the congress.

Heen of FAO mentioned that two freezing vessels of about 150 feet in length are now operating out of Norway. These vessels are landing both frozen eviscerated fish and frozen fillets (packaged in 5- and 10-pound packages). Also at the Fisheries Research Laboratory at Bergen, Norway, studies are being conducted on the development of a vertical plate freezer for freezing fish fillets at sea in block form. This freezer has been tested at the laboratory with some degree of success, and will soon be tested at sea on a commercial trawler.

I talked to Jerzy Kukucz, Professor of Fish Technology, Polytechnic School, Danzig, Poland. He is the head of a new fish technology department that was established at that University about a year ago. At the present time about 165,000 metric tons (364 million pounds) of fish are landed annually in Poland. Within the next ten years it is planned to increase these landings to about 500,000 metric tons (1.1 billion pounds). This will be done by using stern trawlers similar to those of the Russian type. These factory vessels will produce frozen fillets and fish meal and oil. Attempts are now being made to start a frozen food distribution system in Poland; this is needed to increase the distribution of the frozen fish that will be landed by the factory vessels. It was also mentioned that present freezing and frozen storage facilities in Poland are very inadequate.

I also talked to William MacCallum, Fisheries Research Engineer, Fisheries Research Board of Canada, Technological Station, Halifax, Nova Scotia. At the present time his station is conducting studies on the preservation of groundfish in refrigerated sea water. In addition bacteriological, protein, and fish meal and oil studies are being conducted at that station. Results of some preliminary tests on storing haddock and ocean perch in refrigerated sea water show that these fish are of no better quality than fish stored in ice. In fact in some cases the fish stored in sea water were of lower quality than those stored in ice. More extensive experiments on the use of refrigerated sea water are planned. MacCallum also mentioned that the results of other studies conducted at the Halifax station show that there is no appreciable increase in the keeping quality of groundfish due to the use of antibiotic ice. This contradicts the favorable results obtained by Tarr and his co-workers. Other tests on frozen packaged cod and haddock show that those fish should not be stored at 0° F. for longer than 6 months. Results of United States studies show that storage for 9 to 12 months at 0° F. is satisfactory, provided the product is of high quality when frozen. MacCallum also mentioned that they are planning to initiate studies on the development of equipment for improving the handling of fish on the vessel and at the dock.

Gordon Eddie, the principal engineer and a scientific officer at the Torry Research Station at Aberdeen, Scotland, and I had considerable discussions concerning the differences in our projects on freezing fish at sea. The English are having a new freezer-trawler designed, and they are trying to "sell" freezing fish at sea to industry. Several large firms in England are showing considerable interest in this process. Eddie is quite optimistic about its use in the very near future. Eddie and his co-workers have also taken a look at the use of refrigerated sea water for white fish. Results so far show no increased keeping quality for refrigerated sea water-stored fish over that of regular iced fish. They have also found that fish stored in refrigerated sea water for ten days or more contain large amounts of spoilage bac-

teria. Tests are being continued. Studies at Torry on the use of antibiotic ice for storing fish on the vessel show a three-day extension in the keeping quality of the treated fish (at a very low level of quality) is possible over that of regularly-iced fish. No work is being done at Torry on the development of equipment for improving the handling of fish. It is interesting to note that we are the only fisheries research organization that is doing work of this type.

In other conversations I learned that an Italian firm is now outfitting tuna vessels for catching tuna off the coast of Morocco. The fish will be eviscerated and stored in ice on the vessel. Arcoulis of Greece, the operator of several Greek freezer trawlers, was quite enthusiastic about freezing fish at sea. He is blast-freezing large quantities of groupers and sea bream on vessels that are fishing off the western coast of Africa.

Information was obtained on a preliminary design of a 147-foot Dutch stern trawler. The vessel has a chute with a safety door and a completely sheltered deck for handling the fish. The fish hauled up in the net are dropped to the lower deck where they are gutted, washed, and iced in the hold. This type of vessel offers many advantages as a New England freezing-fish-at-sea trawler.

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Part III - Fish Quality Stressed

By Joseph W. Slavin*

CARE OF THE CATCH: Methods of retaining the quality of the catch so as to increase the productivity of the vessel and the acceptability of the fish were discussed in some detail at the congress. In introducing the paper on "The Care of the Catch," Eddie of the Torry Research Station, acting in the absence of the authors, pointed out that fish preservation problems for each area of the world vary considerably. Methods of preservation suitable for one fishery or country therefore may not have the same relative value when applied to another fishery, where conditions differ. This is a salient point and explains why from time to time there are what seem to be conflicts between research results obtained from different countries.

This paper is principally concerned with the control of fresh fish spoilage on the vessel through the use of proper handling, washing, and icing procedures. Temperature is the most important single factor affecting spoilage; therefore the fish must be iced as soon as possible after catching, using a ratio of at least 1 part of ice to 3 parts of fish. British distant-water trawlers, because of the long period at sea, use a ratio of ice to fish of about 1 to 1. In addition to employing sufficient quantities of ice, proper application of the ice is essential for maintenance of quality. The ice should therefore be deployed so as to be mixed thoroughly with the fish and to also provide an effective barrier between the hold surfaces and the fish. Also, important are the observations that (1) deckhead refrigerated grids should be used only to cool the ice on the way to the fishing grounds, (2) the fish hold should be shelved off at 18- to 30-inch intervals to prevent excess pressure and weight loss in the bottom layers of fish, and (3) bacteriological spoilage of the fish may result from using contaminated ice. In this latter instance antibiotics may be of value in the suppression of bacterial multiplication in the ice. The importance of cleanliness in the fish holds is also emphasized, even though the exact value of this practice cannot always be directly measured. In this connection easy-to-clean metallined fish holds are preferred over the conventional wooden-lined holds.

FISH ROOM--ENGINEERING AND ARCHITECTURE: "The Fish Room--Engineering and Architecture," by MacCallum contains a wealth of technical information on the design and construction of fish holds that will be of considerable value to the naval architect in designing new and efficient fishing trawlers. In introducing his *Mechanical Engineer, Fishery Technological Laboratory, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, East Boston 28, Mass.

paper, MacCallum pointed out that naval architects can perform a great service for fishermen and vessel owners by designing vessels which will enable storage and handling of the catch under optimum conditions. His observations were that in the design and construction of the holds of fishing trawlers (1) the proper type and thickness of insulation should be used to reduce ice melting, (2) waterproof membranes should be used on the warm side of the insulation, (3) stanchions should be arranged so that all movable pen boards are interchangeable, (4) hatches should be large enough to permit rapid unloading of the catch, and (5) the inside of the hold should be coated with suitable paint or resin compounds or lined with corrosion resistant alloys.

Data is presented in this paper (1) on the insulation requirements for the fish holds of both large and small vessels and (2) on the effect of insulation thickness on the quantity of ice that must be carried to adequately preserve the catch. Information is also given on methods for determining optimum fish-hold size and on the evaluation of various types of insulating materials, coating compounds, waterproof membranes, aluminum alloys, and other materials. Techniques employed in the construction of fish holds for both large and small vessels are also discussed in some detail.

ICING VERSUS FREEZING: The paper on "Icing Versus Freezing" is an objective comparison of the advantages and disadvantages of freezing or icing of groundfish aboard the fishing trawler. In introducing this paper the author pointed out that naval architects, engineers, and vessel owners and operators must, prior to designing a vessel for freezing or icing fish at sea, carefully consider the effect that these procedures will have on handling aboard the vessel, storage capacity of the vessel, unloading and handling ashore, quality and acceptability of the product, and on the costs of operation. The author, also mentioned that fish preservation and handling problems of different areas sometimes vary considerably; thus freezing at sea may offer special advantages for certain areas, and icing at sea may offer similar advantages for other areas.

In making the study of icing versus freezing, the author used as a basis the United States experimental freezing trawler <u>Delaware</u> and the British freezer trawler <u>Northern Wave</u>. On the <u>Delaware</u>, round haddock and cod were brine-frozen prior to rigor mortis, stored whole in the vessel's hold, unloaded by conventional means, and stored at 0° F. ashore. When removed from storage they were thawed in circulating water, filleted, and the fillets packaged, refrozen, and marketed in the conventional manner. In the <u>Northern Wave</u> project cod were eviscerated at sea, stored with ice, and then after rigor mortis set in plate-frozen in the form of fish slabs. The rectangular slabs of fish were then stored at -20° F. in the vessel's hold and after unloading at the same temperature ashore. Upon removal from storage the slabs of frozen fish were thawed in circulating air, the fish filleted, and the fillets marketed in the chilled or smoked state. It is pointed out that fish frozen at sea on the <u>Delaware</u> and the <u>Northern Wave</u> were of acceptable quality after 8 months of frozen storage.

In his analysis the author stated that freezing fish at sea on the experimental vessels resulted in increased handling aboard the vessel, reduction of the capacity of the vessel, an increase in the time required to unload the vessel, and increased handling at the shore plant—as compared with icing on the vessel. Increased costs may also result from freezing at sea due to extra personnel, higher vessel cost, operation and maintenance of freezing equipment, and frozen storage and associated handling costs ashore. However these costs may well be offset by the advantages associated with freezing at sea; namely, maximum utilization of the vessel's hold every trip, the landing of fish of uniformly high quality, and the storage of frozen fish ashore for use to level out production during slack periods. Thus freezing at sea may be most applicable for a combined vessel-processing plant operation. The author also recommended that new vessels be built for freezing groundfish at sea, rather than convert existing trawlers. In concluding, the author mentioned that in

this connection the U.S. Bureau of Commercial Fisheries has worked up a preliminary design of a new 170-foot freezer trawler which will freeze 3,000 pounds of fish per hour and will have a capacity of over 250 tons of round brine-frozen fish.

OTHER RELEVANT PAPERS: Eric Heen, Chief of the Fisheries Technology Branch of FAO acted as rapporteur and referred to other papers relevant to those on fish quality. In this connection the papers on "Design Studies of Stern Trawlers," by Heinsohn, "Modern Refrigerated Factory Ships in Japan," by Soto, and "Propulsion and Processing Machinery for Deep-Sea Trawlers," by Eddie were most interesting. The latter paper is particularly applicable because it points out that if freezing at sea is employed, it is not necessary for the vessel to return to port as quickly as if icing procedures are used. Thus a cost savings can be obtained in operating a freezer-trawler by reducing the size of the propulsion machinery and the speed of the vessel. In concluding, Heen stressed that much work has been done on the use of antibiotics for fish and their application must be closely appraised; also chilling in refrigerated sea water has been accepted for species of fish such as tuna, mackerel, salmon, and halibut and should be investigated for other species.

FISH HOLDS: The discussions on the session on Fish Holds were for the most part broken down into the subjects of "Chilling" and "Freezing."

Chilling: In his written discussion, the Director, Fishing Industry Research Institute, Capetown, South Africa, referred to some of the important work being done at that station. Of particular interest is the observation that reducing the size of the crushed ice to small pieces of $1\frac{1}{2}$ inches square does not increase the cooling rate of the fish. However, the use of very small pieces of flake ice does result in an increase in the cooling rate. Other salient points are that the ratio of fish to ice should be 1:1 for South African vessels to enable maximum fish-quality retention, and the weight loss for the fish stored at the bottom of the pen is 3 to 7 times greater than that for the fish stored at the top of the pen. Information was also given on the fish wash flume that is now in use on South African trawlers and on current preservation research studies being conducted at Capetown.

Commodore Silva of Portugal mentioned that fish can be satisfactorily kept in ice aboard Portugal trawlers for 10 to 12 days. Many of these trawlers employ mechanical refrigeration to keep the ice from melting on the way to the fishing grounds; the refrigeration is shut off when icing of the fish begins.

Other contributors pointed out that fish-hold linings should be resistant to bacteria, durable, and easy to clean. They stressed the importance of plastics and special varnishes and resins for coating the hold. It was also reported that chlorinated sea water is being used aboard trawlers in the United States and that sea water containing 60 parts per million of free chlorine is effective in washing the eviscerated fish prior to icing, and in washing the vessel's hold in port. This method is finding wide acceptance in the New England fishing industry. Differences in the apparent keeping quality of ice-stored groundfish due to geographical location were also discussed. It appears that in some countries people are accustomed to a somewhat stale fish and therefore prefer it to a fresh relatively bland product; this accounts for some of these differences.

Freezing at Sea: Much interest was shown in the freezing of fish at sea, and there were many valuable contributions on this subject. Of particular interest was a discussion on "Quick Freezing at Sea" delivered by Gino Gianesi, a consulting engineer from Italy. He pointed out that several Mediterranean fishing vessels have been equipped with quick-freezing installations to fish in the Atlantic Ocean, in the tropical waters off West Africa. The fish (consisting of sea bream, groupers and other species common to the West Coast of Africa) are usually gutted, washed, put into boxes, and loaded directly into the vessel's low-temperature blast freezers,

where they are frozen in about three hours. After freezing they are transferred to a -50 to -130 F. refrigerated hold. These fish are usually marketed in the frozen state in Greece and other Mediterranean countries. Gianesi also reported that the frozen fish are of good quality even after seven months of storage and that this activity has given excellent results and is considered to be out of the experimental stage. The author also pointed out that the 124-footGreek transport vessel Euridiki converted to a freezer trawler in 1951 was perhaps the first vessel to be used commercially for quick-freezing at sea. This vessel is equipped with an ammoniacompression refrigeration system having a capacity of about 60 tons of refrigeration. Two air-blast freezers operating at temperatures as low as -49° F. are used to freeze about 6 tons of fish a day. Over 120 tons of frozen fish can be stored in the -4° F. to -13° F. refrigerated fish hold. Successful operation of this vessel resulted in conversion by this company of two larger 229-foot trawlers each having a freezing capacity of 15 tons of fish a day and a frozen fish hold about three times the size of the Euridiki. Three other vessels were then converted to freezerships by another Greek fishing concern. They are the Evangelistria I, II, and III. The first, a converted mine sweeper, is 157 feet long, has an ammonia-compression refrigerating plant with a capacity of 120 tons of refrigeration, and will freeze 12 tons of fish per day in four air-blast quick freezers. This vessel has two refrigerated holds with a total capacity of about 230 tons of frozen fish. The Evangelistria II and III are about 177 feet long and have freezing systems very similar to that of the Evangelistria I. They each have a freezing capacity of 14 to 15 tons of fish a day and a storage capacity of about 300 tons of frozen fish. In concluding, Gianesi mentioned that quick-freezing at sea can now be considered as practical and perfectly safe and that it will be developed in the future, especially in areas where traditional fishing activities along the coast are declining.

Elie Arcoulis, Managing Director of The Evangelistria Company, the owner of several of the Greek-freezer trawlers described, commented on some of the aspects of icing versus freezing. He mentioned that the work on the <u>Delaware</u> and the <u>Northern Wave</u> was experimental and therefore cannot be used as a true basis for determining the economics of freezing fish at sea. They have found in Greece that freezing increases the productivity of the vessel and that the frozen fish can be handled faster than can iced fish. Thawing of the fish in air can be accomplished satisfactorily and with little difficulty. In general, Arcoulis was quite enthusiastic about freezing at sea and reported that this process was meeting with considerable success in Greece.

The remaining contributions were concerned with some of the more controversial aspects of freezing fish at sea. Eddie of the Torry Research Station in Aberdeen, Scotland, mentioned that in the Delaware project they were lucky to get away with brine-freezing; this process was tried in Europe many years ago and was found to be unsatisfactory, the fish being of poor appearance and quality. He also mentioned that the results of the Delaware and Northern Wave projects could not be compared directly since there were different experimental objectives for each study and because of the differences in the fisheries. In a more detailed written statement, Eddie made the interesting observation that the Northern Wave fish were soft because of biological factors owing to catch areas, not because of the freezing process. Eddie also pointed out that the costs of unloading frozen fish from the Northern Wave were less than that for wet fish, water-thawing is not acceptable for large cod where appearance and texture are important, fish can be satisfactorily frozen in a pre-rigor condition, dielectric thawing of frozen fish is being investigated in order to reduce thawing time and costs, and the use of freezing at sea reduces the need for high vessel speed; thus a savings in propulsion machinery can be effected. He also emphasized that freezing at sea need not result in slower handling, although one or two extra men may be required. The advantage of maximum utilization of capacity on every trip may result in capital savings in the number of vessels required to produce a given quantity of edible fish. It was most interesting to note that United

States and British investigators while differing on some of the details concerning freezing at sea, were in substantial agreement on many of the major issues.

In other discussions, Rankine of the United Kingdom emphasized that frozen fish should be stored at -20° F. on the vessel. He also stated that the freezing capacity of the Delaware can not be compared directly with that of the Northern Wave because of the iced-buffer storage used on the latter vessel. In addition, he gave some very interesting information on a modified plate-freezing installation for a new freezership.

The problem of consumer acceptability of sea-frozen fish was expressed by several participants. Parkes of England said that in the United Kingdom a 190-foot trawler was outfitted for freezing at sea. The frozen fish consistently sold for less money than did the iced fish, as a result the project was an economic failure. Heinsohn of Germany, the designer of several large stern trawling factoryships, commented that sea-frozen fish while being of excellent quality are still difficult to market in Germany and in many cases they sell for lower prices than do iced fish. There is, however, much more consumer demand for sea-frozen fillets than for sea-frozen eviscerated fish landed in blocks. This point was also stressed by Gow of England in his discussion of the operation of the factoryships Fairtry I and II.

SUMMARY: These discussions emphasize the need for employment of fish preservation and handling practices that are best suited for the particular fishery in question. For example, in certain fisheries, where vessels are now returning to port half empty, freezing fish at sea may be the solution. In other fisheries it may be more desirable because of quality and marketing aspects to keep the fish in a fresh condition using sufficient quantities of ice, or in some cases, refrigerated sea water. There is no doubt that more effective tailoring of fish preservation techniques to meet industry requirements will do much to solve current problems of low production and high costs.

APPENDIX - LIST OF PAPERS PRESENTED AT THE SECOND WORLD FISHING BOAT CONGRESS

Topic: TACTICS

Session: Fishing Methods and Deck Arrangement

PRINCIPAL FISHING BOAT TYPES, by A. C. Hardy, London, E. C. 2, England.

NOMENCLATURE AND SYMBOLS, by H. Svenkerud, Naval Architect, FAO, Rome, Italy.

DRIFT-NETTING: DECK DESIGN AND EQUIP-MENT, by J. G. de Wit, Deputy Inspector of Fisheries, Ijmuiden, Netherlands.

GILL NET FISHING: DECK DESIGN AND EQUIPMENT, by Thomas E. Colvin, Naval Architect, Waukegan, Illinois, U. S. A.

LONGLINE FISHING: DECK DESIGN AND EQUIPMENT, by Yoshiaki Kanasashi, President, Kanasashi Shipbuilding Co. Ltd., Shizuoka Prefecture, Japan; Chomatsu Doke, Director, Miho Shipyard Co. Ltd., Shimizu City, Shizuoka Prefecture, Japan; Seigoro Chigusa, Director, Nissin Kogyo Co. Ltd., Nakanoshima, Kita-ku, Osaka, Japan.

POLE AND LINE FISHING: DECK DESIGN AND EQUIPMENT, by Shogo Muramatsu, Chief, Design Section, Yaizu Shipbuilding Co., Ltd., Yaizu City, Shizuoka Prefecture, Japan.

TRAWLING: DECK DESIGN AND EQUIPMENT, by A. von Brandt, Director, Institut für Netzfor-

schung, Hamburg, Germany; C. Birkhoff, Rickmers Werft, Bremerhaven, Germany.

TWO NEW TRAWLERS FOR THE NORTH PA-CIFIC, by Dayton Z. Alverson, U. S. Bureau of Commercial Fisheries, Seattle, Washington, U.S.A.; Peter G. Schmidt, Jr., President, Marine Construction and Design Company, Seattle, Washington, U. S. A.

DES BATEAUX DE PECHE SICILIENS SPE-CIALISES (Specialized Sicilian Fishing Boats); by Nito Fodera, Directeur, and Raimondo Sara, both du Centre Experimental Pour l'Industrie de la Peche et des Produits de la Mer, Section Technologique, Palermo, Sicilie; Alberto Cambiano, Architecte Naval, Institut Nautique, Palermo, Sicilie.

Session: Command of Operations

CENTRALIZED CONTROL OF TRAWLERS, by A. C. Hardy, London, E. C. 2, England. H. E. H. Pain, S. G. Brown Ltd., Watford, Herts, England.

Topic: CONSTRUCTION

Session: Scantlings

STEEL AND WOOD SCANTLING TABLES (WESTERN COAST OF U. S. A.), by H. C. Hanson, Naval Architect, Seattle 4, Washington, U.S.A.

SUGGESTED STANDARD SCANTLINGS, by Dwight S. Simpson, Naval Architect, Boston 10, Massachusetts, U. S. A.

COMMENTS ON PAPER NO. 10-SUGGESTED STANDARD SCANTLINGS-SIMPSON, by D. A. S. Gnanadoss, Assistant Director of Fisheries, Madras, India.

Session: New Materials:

GLASS REINFORCED PLASTIC HULLS, by Patrick D. de Laszlo, Director, Halmatic Ltd., Portsmouth, England.

Session: Fish Holds:

THE CARE OF THE CATCH, by G. A. Reay, Director, and J. M. Shewan, both of Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland.

THE FISHROOM - ENGINEERING AND ARCHITECTURE, by W. A. MacCallum, Research Engineer, Fisheries Research Board of Canada, Technological Station, Halifax, Nova Scotia, Canada.

ICING VERSUS FREEZING, by Joseph W. Slavin, Acting Chief, North Atlantic Technological Research, U. S. Bureau of Commercial Fisheries, East Boston 28, Massachusetts, U. S. A.

Session: Installation of Machinery:

PROPULSION ENGINES FOR FISHING BOATS, by Ivar Stokke, Head, Department of Internal Combustion Engines, The Technical University of Norway, Trondheim, Norway.

STEAM VERSUS DIESEL, by G. Hopwood, Chief Engineer, Mirrlees, Bickerton and Day Ltd., Cheshire, England; N. W. N. Mewse, Marine Superintendent, J. Marr and Son Ltd., Fleetwood, Lancashire, England.

PROPULSION SYSTEMS FOR MOTOR TRAWL-ERS, by Franz Süberkrüb, Consulting Naval Architect, Hamburg, Germany.

RECENT TRAWLERS FITTED WITH MULTI-PLE REDUCTION GEARS, by Alexandre Chardome, Civil Engineer and Manager, Beliard, Crighton and Co., Ostend, Belgium.

DEVICE FOR RAISING AND LOWERING PROPELLERS; by Keigo Inamura, Chief, Fishing Boat Section; Motojiro Ninomiya, Chief, Engine Branch, Fishing Boat Section; both of Fisheries Agency, Kasumigaseki, Chiyodu-ku, Tokyo, Japan.

Session: Costs of Construction:

AN ANALYSIS OF DIMENSIONS, WEIGHTS AND COSTS, by Harry Benford, Associate Professor; Miklos Kossa, Naval Architect; both of the Department of Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, Michigan, U. S. A.

Topic: SEA BEHAVIOR

Session: Resistance:

COMMENTS ON HULL FORM DESIGN OF FISHING BOATS, by H. I. Chapelle, Curator, Di-

vision of Transportation, Smithsonian Institution, United States National Museum, Washington 25, D. C., U. S. A.

MODEL TESTS OF SOME FISHING LAUNCHES, by Thomas C. Gillmer, Associate Professor of Marine Engineering, U. S. Naval Academy, Annapolis, Maryland, U. S. A.

REVIEW OF B. S. R. A. TRAWLER RESEARCH, by H. Lackenby, Chief Naval Architect, The British Shipbuilding Research Association, London, England.

AN ADVANCED HULL AND PROPELLER DE-SIGN, by J. Thomas Tothill, Naval Architect, Ship Laboratory, National Research Council, Ottawa, Canada.

STATISTICAL ANALYSIS OF RESISTANCE DATA FOR TRAWLERS, by D. J. Doust, Naval Architect, Ship Division, National Physical Laboratory, Feltham, Middlesex, England.

COMMENTS ON THE PAPER "STATISTICAL ANALYSIS OF RESISTANCE DATA FOR TRAWLERS," by D. J. Doust; by Norio Fujinami, Naval Architect, FAO, Rome, Italy.

THE LOADS IMPOSED BY TRAWLING GEAR, by W. Dickson, Senior Scientific Officer, Marine Laboratory, Torry Research Station, Aberdeen, Scotland.

SOME TURKISH FISHING BOATS, by Ata Nutku, Professor of Naval Architecture, Technical University, Istanbul, Turkey.

Session: Seakindliness:

NEW PERSPECTIVES IN SEA BEHAVIOR, by G. Vossers, Head, Seakeeping Laboratory, Netherlands Ship Model Basin (N. S. M. B.), Wageningen, Netherlands.

BEHAVIOR OF TRAWLERS AT SEA - II, by Walter Möckel, Captain, Naval Architect, Hamburgische Schiffbau-Versuchsanstalt, Hamburg 33, Germany.

REMARKS ON THE SHAPE OF DUTCH COAST-AL FISHING BOATS, by W. Zwolsman, Naval Architect, Holland Launch N. V., Zaandam, Netherlands.

TESTS WITH A TRAWLER MODEL IN WAVES, by J. D. van Manen, Under-Director; G. Vossers, Head, Seakeeping Laboratory; H. Rijken, Naval Architect; all of Netherlands Ship Model Basin, Wageningen, Netherlands.

THE PRISMATIC COEFFICIENT, by Jan-Olof Traung, Chief, Fishing Boat Section, Rome, Italy.

TRAWLER FORMS WITH BULBOUS BOWS, by D. J. Doust, Naval Architect, Ship Division, National Physical Laboratory, Feltham, Middlesex, England.

TESTS OF FISHING BOAT MODELS IN WAVES, by Kaname Taniguchi, Chief, Nagasaki Experimental Tank Laboratory, Mitsubishi Shipbuilding and Engineering Co. Ltd., Nagasaki, Japan.

Session: Stability:

NOTES ON STABILITY, by Atsushi Takagi, Professor, Department of Naval Architecture, Faculty of Engineering, University of Tokyo, Bunkyo-ku, Tokyo, Japan.

TRANSVERSE STABILITY OF TUNA CLIP-PERS, by John Randolph Paulling, Jr., Assistant Professor of Naval Architecture and Marine Engineering, University of California, Berkeley, California, U. S. A.

A METHOD TO DETERMINE FREEBOARD IN RELATION TO STABILITY, by Olgierd Jablonski, Naval Architect, The Maritime Institute, Gdansk, Poland.

SAFETY FROM CAPSIZING, by Kurt Wendel, Professor of Ship Design and Theoretical Naval Architecture, Technical University of Hannover, and University of Hamburg, Germany.

Session: Safety at Sea:

CAUSES OF ACCIDENTS, by Wm. C. Miller, Naval Architect and Marine Engineer, Wm. C. Miller and Associates, San Diego 1, California, U. S. A.

Topic: PRODUCTIVITY

Session: Symposium of Boat Types:

DEVELOPMENT OF A BOAT FOR INDIA'S SURF COASTS, by Peter Gurtner, Naval Architect (India), Organization of the United Nations FAO, Rome, Italy.

COMMERCIAL OUTBOARD FISHING CRAFT, by David D. Beach, Naval Architect, Waukegan, Illinois, U. S. A.

PHILIPPINE FISHING BOATS, by Santos B. Rasalan and J.B. Malig, both of Bureau of Fisheries, Manila, Philippines; Ildefonso Lachenal, President, Luzon Slipways, Navotas, Rizal, Philippines.

TRADITIONAL JAPANESE SMALL FISHING CRAFT, by Yoshinori Otsu, Chief; Nobutatsu Yokoyama, Chief, Hull Branch; Tsutomu Kobayashi, Naval Architect; all of Fishing Boat Laboratory, Fisheries Agency, Tsukishima, Tokyo, Japan.

DESIGN AND MASS PRODUCTION OF SHRIMP TRAWLERS, by L. C. Ringhaver, President, Diesel Engine Sales, Inc., St. Augustine, Florida, U. S. A.

DEVELOPMENT OF A TRAWLER OF UNOR-THODOX DESIGN, by E. C. B. Corlett, Managing Director, Burness Corlett and Partners Limited, Naval Architects and Marine Consultants, Worting and London, England; J. Venus, Managing Director, Seawork Limited, London, Managing Director, P. K. Harris (Shipbuilders) Ltd., Appledore, Managing Director, T. E. Mitchison Ltd., Gateshead-on-Tyne, England.

THE NETHERLANDS POST-WAR FISHING FLEET, by P. Boogaard, Chief, Shipping Department, Ministry of the Building Industry, Rotterdam, Netherlands.

DESIGN STUDIES FOR STERN TRAWLERS, by Heinz Heinsohn, Rickmers Werft, Bremerhaven, Germany.

DIESEL WHALE CATCHERS, by Tomijiro Nakata, Chief, Design Division, Hayashikane Shipbuilding and Engineering Co. Ltd., Shimonoseki City, Yamaguchi Prefecture, Japan.

MODERN REFRIGERATED FACTORYSHIPS IN JAPAN, by Shigeru Sato, Chief, Design Section, Hitachi Shipbuilding and Engineering Co. Ltd., Innoshima Shipyard, Innoshima, Hiroshima Prefecture, Japan.

Session: Choice of Size and Type:

CHOICE OF BOAT TYPE AND SIZE FOR POLISH DEEP-SEA FISHERIES, by Jerzy Swiecicki, The Maritime Institute, Gdansk, Poland.

PROPULSION AND PROCESSING MACHINERY FOR DEEP-SEA TRAWLERS, by G. C. Eddie, Torry Research Station, Aberdeen, Scotland.

NAVIRES FRANCAIS DE GRANDE PECHE SALEE, by E. R. Gueroult, Architecte Naval, Paris 2e, France.

DES BATEAUX DE PECHE SICILIENS SPECI-ALISES, by Alberto Cambiano, Architecte Naval, Institut Nautique, Palermo, Sicilie; Vito Foderá, Directeur, and Raimondo Sará, du Centre Expérimental pour l'Industrie de la Pêche et des Produits de la Mer, Section Technologique, Palermo, Sicilie.

POINT DE VUE d'UN ARMATEUR DE BATE-AUX DE PECHE, by L. Soublin, President de la Federation des Armateurs a la Peche, Fecamp (Seine-Maritime, France).



AN ECONOMIC AND FINANCIAL STUDY OF THE FLUKE OTTER-TRAWL FISHERY OF NEW JERSEY

By Frans L. Widerstrom, Jr.*

ABSTRACT

A large part of the New Jersey summer flounder or fluke fishery is found in the southern part of the State. The inshore fleet is composed of older, small boats (less than 40-foot length) and newer medium-sized vessels (40- to 49-foot length). Nearly all of the medium craft were built in the postwar period and represent the more efficient segment of the inshore fleet.

Offshore vessels range from 55 to over 100 feet in length. Gross receipts, net profit, and return on investment indicate that the offshore fishery is the most profitable despite the large initial investment required.

BACKGROUND

Otter trawlers known as "draggers" were not successfully operated from New Jersey ports until some time after World War I; as late as 1921 their number did

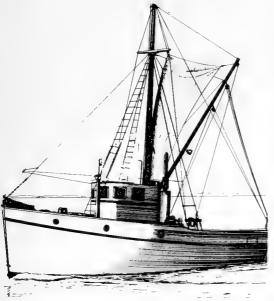


Fig. 1 - Small New Jersey fluke otter trawler or dragger (less than 40 feet, length over-all).

not exceed a dozen. However, the proven efficiency of the otter trawl forced the eventual replacement of older types of gear such as hand lines and pound nets. More recent developments in the size and composition of the New Jersey dragger fleet are indicated in table 1.

Table 1 - Two-Year Comparison of New							
Jersey Otter-Trawl Flee							
Item	1955	1957					
	(Nun	nber)					
Motor vessels (5 net tons							
and over)	164_	158					
Motor boats (less than 5							
net tons)	62	24					
Otter trawlers by Counties:							
Atlantic	40	28					
Cape May	114	85					
Monmouth	32	34					
Ocean	40	35					
Total	226	182					

The importance of the fluke fishery to the New Jersey otter-trawl fleet is summarized in table 2.

The total ex-vessel value of the catch landed by the otter-trawl fleet during 1957 in New Jersey was \$1.8 million. Flounders, nearly all fluke, accounted for about 46 percent of the total catch value; scup, 17 percent; sea bass, 8 percent; and northern lobster, 9 percent. The remainder was composed of some 40 other commercial species.

Table 2 - New Jersey Otter-Trawl Fleet Landings of Leading Commercial Species, 1957 Ex-vessel Quantity Species Value 1,000 Lbs. \$1,000 Fluke and mixed flounders . 5.120 842 Scup (porgy) 6,461 320 Sea bass..... 1.399 160 Northern lobster . . 546 172 8,202 349 Total 21,728 1,843

*Commodity-Industry Economist, Branch of Economics, Division of Industrial Research and Services, U. S. Bureau of Commercial Fisheries, Washington, D. C.

The three leading counties produced all of the fluke catch landed by New Jersey otter trawlers. Most of the fluke was caught by otter trawlers, but a small quantity was caught by other gear.

Cape May County was dominant in the New Jersey flounder fishery during 1957.

Its 85 otter trawlers were the largest single fleet of a total of 182 vessels and boats in the State. Of the total New Jersey flounder catch, the Cape May County fleet accounted for 44 percent of the quantity and 42 percent of the value. That is the reason for selecting Cape May County as typical of the New Jersey summer flounder or fluke fishery.

Table 3 - Flounder Landings by the Three Leading						
Counties of New Jersey, $1957\frac{1}{}$						
County Quantity Ex-vessel Value						
Atlantic 1,000 Lbs. \$1,000 Cape May 2,268 358 Ocean 1,115 202						
Total	5,143	844				
1/ Mostly caught by otter trawlers, but in other types of gear.	1/ Mostly caught by otter trawlers, but includes a small amount caught by					

INSHORE FLUKE OTTER TRAWLERS

SMALL BOAT FLEET: The development of the southern New Jersey fluke fishery started with the conversion of small hand-line and trolling craft to otter trawling. These boats were 25 to 30 feet in length and were powered by means of 20- to 40-horsepower gasoline engines. The abundance of fluke and related species made this small-scale operation profitable from 1925 to 1935. A gradual replacement of small boats was begun prior to World War II. However, many of the craft continued



Fig. 2 - Medium New Jersey fluke otter trawler or dragger, shrimp-boat style (40-to 49 feet, length over-all).

in use for the duration of the war because of material shortage and construction restrictions. Partial modernization was accomplished during the war by repowering with Diesels and by replacing the rope-towing warps with wire. The small draggers that remain active at this time are manned by two men. Current fleet additions are of a larger size.

Fishing Gear: The inshore trawlers fish two distinct trawl nets, depending upon the species sought. The fluke or flatfish net has a rather large mesh and is designed to be towed at slow speed. The round fish trawl net has a smaller mesh and longer wings. The inshore boats carry both types of nets and may fish for flatfish or round fish during the day if one type of

fishing proves unproductive. The emphasis is on fluke fishing, however, because of its higher market value.

<u>Fishing Operations</u>: A combined 1957 operational statement for three of the small trawlers is shown in table 4. The actual fishing season extends from May to October.

Table 4 - Average Receipts, Expenditures, and Net Returns for Three Small (under 40 feet) Inshore Otter Trawlers (Fishing for Fluke in	Select 1957)	eted
Average total receipts per boat	9	33,105
Expenditures (average per boat):		
Maintenance and repairs including marine railway charges, hull and		
marine engine repairs, electronic-gear maintenance and painting		
of a nondepreciable nature	308	
Other operating expenses:		
Diesel and lube oils, ice, grease, etc	419	
Subsistence at sea for crew	229	
Stevedoring and casual labor	30	
Fishing supplies of nondepreciable nature	99	
Fixed charges:		
Insurance	44	
Depreciation	465	
Fishing licenses and business taxes	43	
Crew shares	396	
	2,033	
Net profit from 1957 fishing operations per boat		1,072

The gross stock average of the three sample boats reflects the marginal nature of this segment of the New Jersey trawler fleet.

Owners of the small draggers attempt to minimize repairs and replacements by postponing such work or by doing much of the work themselves. Diesel-engine overhauls are expensive and each operator seeks to prolong the period between overhauls.

Daily operating costs are closely controlled. The fishing crew shares in those expenses and it is to the advantage of everyone involved to maintain costs at the absolute minimum.

Fixed charges are met by the owner. The relatively low average insurance premium indicates the small

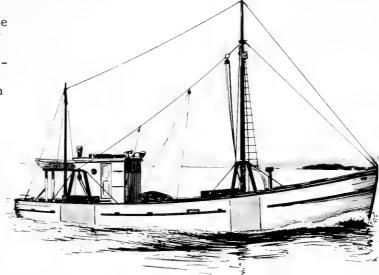


Fig. 3 - Large New Jersey fluke otter trawler or dragger (49 to 70 feet, length over-all).

coverage purchased. Hull insurance is considered too expensive. Limited in-port fire insurance and/or some sort of workman's compensation insurance constitutes the insurance coverage. The small scale of the fishing prohibits the establishment of a depreciation reserve account. The owner uses such funds as though they were part of his current earnings. Business taxes include state fishing licenses and the employer's share of employee's Social Security taxes.

The average crew share earnings for 1957 show the general condition of the New Jersey small-boat fishery. Considerable labor difficulty has been encountered by owners in recent years. Alternative employment aboard larger trawlers and clam-dredging vessels has been much more attractive to otter-trawl fishermen aboard the smaller craft.

Capital Investment: The accounting practice with regard to depreciation charges for capital investment is to list separately the purchase price of the boat hull, engine, electronic gear, equipment and fishing gear. The hull is normally charged at a 15-year rate; the engine, 5 years; electronic gear, 3 to 5 years; fishing equipment, 5 years; and fishing gear, 3 years. Although there is some variation in charges, experience has taught that the estimated life very nearly approximates the actual life. A newly-enforced Internal Revenue Service regulation requires that a salvage value be calculated for all charges. Thus, if the estimated salvage value of fishing vessel #1 is \$300, the basis for depreciation is \$1,200 rather than the full \$1,500 capital outlay.

Each of the three boats used in this study is more than 15 years old; two are more than 25 years old. Two of the hulls are listed as being fully depreciated. An annual charge is made on the third only because it was purchased recently. Each buyer is entitled to depreciate his business investment irrespective of what the previous owner had done.

The owners of the smaller fluke trawlers either purchased most of their electronic gear in the immediate postwar period and thus it is fully depreciated, or fish without benefit of those aids. The large initial outlay required for purchases of sounding devices, radiotelephones, loran, etc., is usually prohibitive for the small dragger owners.

Table 5 - Capital Investment in Three Selected Small

Equipment items include deck gear, winches and wire, towing blocks, etc. The replacement of these items is expensive. Most of the small boats used old or rebuilt equipment.

The business automobile depreciation is handled on a prorated basis. A \$1,000 automobile used 40 percent of the time for business, is assumed to have a business value of \$400.

Table 5 - Capital investment in Three Selected Small					
(under 40 feet) Inshore Otter Trawlers Fishing for					
Fluke in 1957					
Trake III					
Depreciable Item		ing Ve			
Depreciable Item	#1	#2	#3		
		. (\$).			
Hull	1,500		~		
Engine	500		1,200		
Electronic gear	-	375	-		
Equipment	1,021	-	740		
Business auto	-	-	500		
Fishing gear	360	75	525		
Improvements	400	117	610		
Office and storage		2,000			
Total	3,781	2,567	4,775		
Average total investment					
per boat				3,708	

The recent introduction of nylon and other synthetic fibers has extended the usable life of many fishing gear items. However, much of the gear is of the older type and the three-year depreciation continues in use.

Improvements are repair or replacement items of a depreciable nature. They are not charged as repairs against a single year's operations.

Return on Investment: No differentiation is made by owner-operators between their regular share as a crew member and the boat's share of the total receipts. Very little absentee-ownership exists among small trawler propietors. The small otter trawler is not in great demand and many of the present owners intend to use the boats until they qualify for Social Security benefits.

Available Financing: Limited commercial bank financing is used. Dock operators, net and gear suppliers, and others extend short-term credit for materials and supplies. Bank financing is used only in cases where a boat is to be replaced or renovated to a major extent.

MEDIUM-SIZED OTTER-TRAWL FLEET: The construction of the larger inshore fleet of 40- to 49-foot vessels was greatly accelerated in the postwar years of 1946 to 1949. Most of the craft were built in Virginia boatyards. One of the most popular models is a Chesapeake "vee" bottom about 42' x 12' x 4-6'. The deck plan is that of a forecastel with a pilothouse fitted into it and a large fish hold aft. The engineroom is located below the pilothouse and forward of the hold. The most common power plant is a rebuilt Diesel of about 165 hp. The mast, booms, rigging, and two-drum winch are located aft of the pilothouse. Offshore-style gallows are not in general use. A welded towing boom of 4-inch pipe is fitted with a double towing block. Electronic gear includes a radiotelephone, loran, and echo-sounder. Otter-trawlers of this class are manned by two men.

Fishing Gear: It is aboard medium draggers that the use of both flatfish and roung fish nets is most extensive. The term "round fish" includes such varieties as sea bass, sea trout or weakfish, and scup or porgy.

The change-over from one type of fishing to another is relatively simple and little fishing time is lost. This limited flexibility actually extends the working year by enabling vessel operators to take advantage of seasonal runs of round fish. As with other types of fishing, it is quite important for inshore trawler fishermen to be able to work as much of the year as possible.

Table 6 - Average Receipts, Expenditures, and Net Returns for F Medium (40-49 feet) Inshore Otter Trawlers Fishing for Fluk		
	(\$)
Average total receipts per vessel		7,055
Expenditures (average per vessel):		
Maintenance and repairs	467	
Other operating expenses:		
Diesel and lube oils, ice, grease, etc	1,032	
Subsistence at sea for crew	253	
Stevedoring and casual labor	77	
Fishing supplies of a nondepreciable nature	49	
Fixed charges:		
Insurance	185	
Depreciation	1,002	
Fishing licenses and business taxes	74	
Crew shares	1,110	
Total expenditures and outlay (average per vessel)	4,249	
Net profit from 1957 fishing operations		2,806

<u>Fishing Operations</u>: A combined 1957 operational statement for four of the medium-sized trawlers is shown in table 6. The actual fishing season extends from May to October or later.

The average gross receipts or gross stock for the sample vessels was more than double that of the smaller boats. The larger craft are better equipped with modern fish-finding aids, efficient deck gear, and better power plants, and are manned by younger fishermen.

The larger size of hulls, the complexity of electronic equipment, and the intensity of fishing effort contribute to the high maintenance costs of the vessels. The pressure to "make do" or repair one's own equipment is not as strong here as it is aboard the smaller boats. Many of the 40- to 49-foot draggers are now approaching ten or more years of age. The costs of upkeep tend to increase with age as the accumulated ravages of wear and tear must be rectified.

Daily operating expenses reflect the differences in fishing intensity between the medium and small craft. The size and seaworthiness of the medium craft make it possible to fish in less than optimum weather. These newer draggers may be used to better advantage in the round-fish seasons when larger fish-hold capacity becomes important. Fishing for round fish requires that the net be towed at a faster

rate of speed; thus more fuel is burned per daily trip. In addition, the 40- to 49-foot trawlers are equipped with more powerful engines which consume more fuel per hour.

On the basis of an average 30-week fishing season, crew shares were not large in 1957. Not all shares are included in this amount, however. The initial cost of many of the postwar replacement vessels was such that family or other partnerships were formed and have been continued. Partners' shares are deducted from the net earnings of the vessel and are not reported as wages.

Capital Investment: The owners of the medium inshore vessels follow the same general accounting practices as previously outlined for small-boat operators.

Two of the medium vessels used in this study were built in 1947, the newest vessel in 1954 and the oldest in 1934. Only the latter hull has been fully depreciated. The amount listed for engine investment for fishing vessel #4 is somewhat inflated. Due to the need for engine replacement and simultaneous refinancing, the owners were forced to purchase anew power plant. The usual practice is to buy a rebuilt, surplus Diesel for about \$3,000. The cost of the engine for fishing vessel #6 has been included in the hull investment figure.

Table 7 - Capital Investment in Four Selected Medium								
(40-49 feet) Inshore Otter Trawlers Fishing for								
	Fluke in 1957							
Depreciable		Fishing	Vessel					
Item	#4	#5	#6	#7				
Hull	\$4,000	\$6,287	\$ 8,200	\$ -				
Engine	9,280		_	2,800				
Electronic gear	346	-	-	_				
Equipment	2,310	-	1,928	499				
Business auto	400	1,800	1,040	-				
Fishing gear	3,660	_	1,030	-				
Improvements	1,765	1,490	1,260	350				
Office and								
storage		_		1,050				
Total	\$21,761	\$9,577	\$13,458	\$4,699				
Average total investment per vessel \$1								

Only the newest vessel lists electronic gear as a depreciable item. The others are equipped with this gear but it had been fully depreciated. The average equipment investment for the medium-sized trawlers was three times as much as that for the small-boat fleet.

Business automobile depreciation charges are made in the same manner as described earlier.

The fishing-gear investment for fishing vessel #4 reflects the degree of modernization and experimentation conducted by the partners of this vessel. Financial difficulties have forced them to attempt a large-scale "come back" in order to survive as independent operators in the fishing industry. With the very best of luck, however, it will take several years for them to firmly re-establish themselves.

It is interesting to note that 3 of the 4 medium vessels listed no investment in office or storage facilities. One explanation for this lies in the fact that the more efficient craft are tied economically to the dock from which they work and vice versa. The docks provide the necessary storage space and make available many other accommodations for their fishing fleets.

Return on Investment: Many of the difficulties inherent in the small-boat analysis are also present in the analysis of the newer medium inshore trawlers. The number of partnerships is large. The captain-operator's share and, in many cases, his fishing-investing partner's share are included in the net earnings of the vessel.

An active fisherman thinks of his boat as a tool for earning his living. There is some awareness of the fact that a given investment should provide a reasonable rate of return, but this is a secondary consideration.

As in the case of the smaller draggers, no serious attempt is made to set aside a reserve for depreciation. From an investment viewpoint, fishermen are faced with the same dilemma as are other small businessmen. The replacement costs of all gear and equipment items are rising; even with a depreciation reserve, the amount so ear-marked would be inadequate.

Available Financing: The better earnings, the larger investment, and the relative youth of the fishermen on the medium vessels make their owners better credit risks and thus more eligible for commercial bank credit. The credit worthiness of the individual owner is the decisive factor. Some operators must rely upon traditional credit sources such as suppliers and docks.

OFFSHORE FLUKE OTTER TRAWLERS

LARGE-SIZED VESSEL FLEET: The offshore and inshore fleets are hardly comparable. The fishing seasons are complementary: inshore, May to October;

offshore, October to May. Many of the inshore vessels work almost exclusively on fluke; offshore craft seldom do.

Fishing Grounds: Inshore vessels depend upon sloughs and deeper areas of coastal waters inside the 15-fathom contour which extends 20 to 30 miles from shore. Offshore vessels normally begin fall operations somewhere between the 10- and 15-fathom line and shift gradually offshore as the goseason progresses, finishing the winter on the edge of the continental shelf. The area of most intensive offshore fishing effort is situated between 30 and 60 miles southeast of Delaware Bay in an area covering 1,500 square miles.

Vessels and Equipment: Offshore vessels range in length from 55 to about 100 feet. Vessels in the 60- to 70-foot class are the most numerous and seem adequate for the hard use to which they are subjected. Offshore vessels utilize marine Diesels in the 170- to 500-horsepower range. The crew of 4 to 6 men includes the captain. All of the deck gear, rigging, nets, and equipment are

a Barnegat
Lightship

Brigantine Inlet

Atlantic City

Ocean City

Sea Isle City

Delaware Bay

McCries, Shoal

Cape Heniopen

Overfalls Lightship

Indian River Inlet

Fenwick Isle Shoal

Ocean City Inlet

Great Gull Bank

Winter Quarter Lightship

Chincoteogue Inlet

Fig. 4 - Chart of fishing ports and grounds near New Jersey.

of heavy construction. The peak of the offshore season occurs during the winter months; the wear and tear on all equipment is heavy.

Fishing Gear: The basic otter-trawl net used is similar to that used for round fish by the medium vessels, but the twine is heavier, larger otter boards are used, and wooden rollers are employed on the bottom edge of the net.

Owners of offshore vessels attempt to keep them in operation throughout the year. However, during the years 1946-53 an estimated 90 percent of the fluke

landings of the large otter trawlers were made in the October to May period of each year (June and Reintjes 1957). The situation has not changed substantially since then. Off-season types of fishing include trawling for lobsters and dredging for sea scallops. These supplementary operations are necessary in that they pay their share of fixed annual costs and tend to keep the fishing crew intact and employed. Despite the advantages of 12-months fishing operations, many of the offshore craft remain idle during the summer season. Engines, hull, fishing gear, and equipment are overhauled thoroughly.

Fishing Operations: A combined 1957 operational statement for five offshore large trawlers is presented in table 8.

Table 8 - Average Receipts, Expenditures, and Net Returns for E	live Sele	ected
Large (over 49 feet) Offshore Otter Trawlers Fishing for Fluk	e in 195	7
Average total receipts per vessel		\$35,787
Expenditures (average per vessel):		
Maintenance and repairs	3,019	
Other operating expenses:		
Diesel and lube oils, ice, grease, etc	7,890	
Subsistence at sea for crew		
Stevedoring and casual labor	369	
Business auto expense	86	
Fishing supplies of nondepreciable nature	352	
Fixed charges:		
Insurance	1,702	
Depreciation	2,933	
Fishing licenses and business taxes	269	
Crew shares	12,022	
Total expenditures and outlay (average per vessel)	29,822	
Net profit from 1957 fishing operations per vessel		5,965

The gross stock average is not large in relation to the intensity of fishing effort, the risks involved, and the longer trips lasting a week or more. The "steaming time" to and from the fishing grounds may amount to 12 to 24 hours or more. The operating costs of this lost time must be recovered from the few days of fishing.

The average repair and maintenance charges indicate the attention paid to details of hull, engine, and equipment upkeep. Lost time on the fishing grounds represents lost earnings to the vessel and crew. Lives and investment depend upon the over-all seaworthiness of the vessel and gear. A month in early summer is devoted to renovating the vessel and gear. This investment of time and money more than pays for itself in the elimination of lost fishing time.

The per-trip operating expenses are relatively high. The main propulsion unit, lighting, and pumping motors are operated on a continuous basis. An experienced engineer is carried to give the engines the constant maintenance required.

Stevedoring and casual labor charges are encountered when a trip is landed in other than the vessel's home port. The business automobile charge represents a prorated share of such costs incurred by the owner while on vessel business in port. The fishing supplies cost covers nondepreciable items.

Average insurance costs include those for the vessel and her crew. The risk of accident is always present in the offshore fishery. Insurance rates are high enough to work as an effective limitation on the amount of coverage purchased.

Average depreciation charges indicate the large investment required in the offshore fishery.

The business taxes charge includes the vessel's share of the crew's Social Security taxes and other incidental taxes.

The crew-share earnings are calculated for division among three men with a per-man average of about \$4,000. The fishing captain is normally an owner or partner and his share is deducted from the vessel's net earnings.

Capital Investment: The hull investment for fishing vessel #8 is low in relation to the other trawlers because it was built in a low-cost area of Virginia. The cost

Table 9 - Capital Investment in Five Selected Large (over 49 feet) Offsh Otter Trawlers Fishing for Fluke in 1957					nore	
	Fighing Vessel					
Depreciable Item	#8	#9	#10	#11	#12	
Hull	\$ 8,500				\$31,000	
Engine	4,000	3,200	13,300	7,220	24,389	
Electronic gear	350	362	1,025	-	-	
Equipment	3,585	2,887	-	2,301	1,800	
Business auto	1,425	1,750	-	2,100	1,000	
Fishing gear	1,397	933	-	2,800	3,500	
Improvements	500	1,508	5,860	1,600	4,650	
Office and storage	1,200		-	100	_ -	
Total	\$20,957	\$25,940	\$34,185	\$29,691	\$66,339	
Average total investment per						\$35,422

of hulls #9, #10, and #11 are typical for vessels of this size and service. Vessel #12 is larger, over 100 feet in length, and was built in a high-cost period, 1943.

Rebuilt Diesels power vessels #8 and #9. Vessel #10 has been recently repowered with a new, heavy duty Diesel and the production and earnings record of this vessel after the installation of the new engine shows the advisability of the action taken. Vessel #11 was purchased used and fully equipped; the total cost was much less than if the vessel had been bought new. The power plant of vessel #12 is officially rated at 500 horsepower. The engine is more than adequate for fishing use but operating and maintenance costs are quite high.

Recent loran installations account for the similar electronic gear investment in vessels #8 and #9. Vessel #10 has undergone extensive replacement of fully-depreciated items as part of an almost complete renovation. The electronic gear aboard vessels #11 and #12 is totally depreciated.

The equipment investment in three of the vessels, #8, #9, and #11, indicates shifts to other types of fishing; that of #10 has not been replaced; that of #12 represents major repairs to damaged deck gear.

The business automobile depreciation charge is made in the same manner as the comparable charge by small-boat owners.

The fishing gear investments in vessels #8, #9, and #11 are indicative of changes in operations. The sizable gear investment in vessel #12 represents the replacement of lost and damaged gear.

The newness of vessel #8 has meant that no large-scale improvements were necessary. The improvements listed for vessel #9 and #11 are nominal and were probably made to compensate for normal wear and tear. Vessel #10 and #12 have undergone extensive overhauling.

Office and storage depreciation charges are not shown for 3 of the vessels; one other lists a nominal charge. The remaining vessel's depreciation charge is made

because of the type of operation conducted by the owner. The latter vessel shifts from dock to dock according to the operator's estimate of where he can receive the largest price for his landings. This degree of independence exacts its toll in that private storage and office facilities must be maintained. The owner is of the opinion that the additional investment and maintenance costs are offset by the higher prices received and that he actually earns an annual profit on his extra investment.

Return on Investment: It is assumed that the captain's share amounts to no more than his regular crew share of \$4,000. This would provide a remainder of \$1,965, presumably the net return on investment. On an average investment of \$35,422 the rate of return would be calculated at about 5 percent. The risk nature of the investment, the ever-increasing costs of replacement, and the more attractive, less uncertain return offered by alternatives are factors which render this rate of return rather low by comparison with other investment opportunities.

Available Financing: The owners of offshore vessels are required to make a substantial initial investment. The sale of a previously-owned vessel or other equity provides the down payment. Bank financing is extended to buyers having good credit standing. However, when bankers are unwilling or unable to finance the purchase, the seller may be of assistance by accepting a vessel mortgage on the unpaid balance. The term of these mortgages is 3 to 5 years. During the period of repayment, the new owner must carry full vessel insurance. The costs of insurance and interest are deducted from the boat share which totals 35 to 40 percent of the gross stock. The interest and insurance costs are legitimate business expenses, chargeable against the business activities of the year in which paid. Mortgage payments are not expense items for tax purposes. The total purchase price, less salvage value, is listed on the depreciation schedule for the year in which the hull, engines, and equipment were bought. The total depreciation amount chargeable is often less than the actual mortgage payments. This method of accounting works a hardship on the purchaser. Operations must be intensive to meet the added expense of interest and insurance, mortgage payments, and other incidental added costs. The larger gross stock which accompanies such intensity normally results in a greater net profit; this in turn leads to a large income-tax liability.

The 35 to 40 percent boat share is set aside in a regular bank checking account. Maintenance and other costs are paid out of this account. It also provides a source of capital for future business expansion.

Usual credit sources such as suppliers and ship chandlers, dock operators, and others are open to offshore fishermen. These forms of credit are usually of short term and are on a more or less informal basis.

New Credit Source: The recently-created Federal Fisheries Loan Fund will probably be of greatest importance to the offshore fleet. Profit records, the amount of owner equity, and other considerations seem to enhance the credit standing and eligibility of this group.

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A REPORT TO THE SHELLFISH INDUSTRY 1/2

By Arnie J. Suomela*

THE PARTNERSHIP APPROACH

To me, the most significant characteristic of activities of the recent past in the shellfish field has been the fine teamwork which has been displayed. The partner-

ship approach has appeared repeatedly and it has embraced all parties--Federal and state governments, private agencies and industry. In viewing the reports from our personnel, upon which I am basing my remarks, I constantly found mention of cooperative action. That's a very healthy sign and it promises well for the future.

I think this kind of an attack on problems of joint interest is something of a tribute to my immediate boss--Assistant Secretary for Fish and Wildlife Ross Leffler--for he's been preaching this theme continuously. It must be clear to everybody now that he really

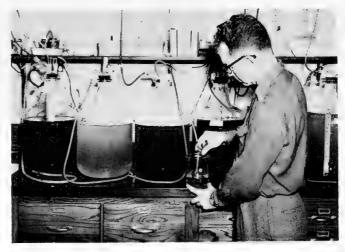


Fig. 1 - At Milford, Conn., food for larval oysters and clams is grown in warm water supplied with nutrients and fluorescent light.

meant it when he said Fish and Wildlife Service people were going to operate on a partnership basis because all the jobs before us demanded a joint effort by all our agencies with the full force of the combined trained manpower available. There are no solo performances in an effective attack like the one which is now being mounted.

Perhaps one of the best examples of what I'm citing is the partnership program set up by the memorandum of understanding between the Fish and Wildlife Service, the Food and Drug Administration, and the Oyster Institute last December 12. This program is better known as GICORP--standing for Government-Industry Cooperative Oyster Research Project. Its objectives are to study characteristics of oysters from areas of the Chesapeake Bay and other areas unanimously agreed upon in the future, from the time of harvesting through to final destination. This is being done to accumulate data as a basis for evaluating, and possibly amending, the definitions and standards of identity for raw oysters, thereby insuring practical, enforceable standards which will protect the consuming public.

The first step was the establishment of a research team from each of the participating groups, headed by a Director empowered to organize and guide research under the new program. The first report of the results of the GICORP studies was given by the technical committee and the Director on May 25.

PROMOTIONAL PROGRAM

Another development recently on the marketing side of the ledger which I am certain is of interest to you relates to a new promotional effort of the U. S. Bureau of Commercial Fisheries to stimulate the public use of all fisheries products. Using Saltonstall-Kennedy Act moneys, the Bureau has awarded a contract to a film 1/ From an address delivered by the author at the Joint Convention of the Oyster Institute of North America and National Shellfisheries Association, Washington, D. C., July 27, 1959.

* Commissioner, Fish and Wildlife Service, U. S. Department of the Interior.

company to produce four basic public service promotional TV presentations which are subdivided into three shorts, each 10 and 20 seconds and 1 minute in length.

They are ultramodern animated cartoon-type presentations especially designed to awaken public interest in the use of fish and shellfish for healthy, wholesome meals on the family table. The first of these is scheduled to appear at the time of National Fish Parade, October 19-25, 1959.

OYSTER AND STARFISH RESEARCH

I know it's not necessary for me to emphasize here the importance of being armed with the findings from biological research in order to improve the management of the shellfishery resource. You recognize full well that only through better biological knowledge of the fish and shellfish resources can we initiate the steps required to get full application of the principle of maximum-sustained yield of such products. Learning how to minimize the limiting factors which plague the resource is an important part of the task facing us.

Two major problem areas continue to exist in the oyster industry. Our approach in both cases employs the close teamwork principle. One problem centers in Delaware Bay where extensive oyster mortalities have occurred and oyster production has reached an extremely low level. The other is in Long Island Sound where starfish continue to be extremely abundant and their predations have caused great losses of seed and adult oysters.

<u>DELAWARE BAY PROBLEM</u>: The U. S. Fish and Wildlife Service has been aware of the serious oyster problem in Delaware Bay for some time, and has taken a number of steps to assist the industry.

First, we have allocated funds to Rutgers University to expand their State-financed research into the cause of the oyster mortality in Delaware Bay. A contract with Rutgers was begun in the spring of 1958 and has been continued and expanded since that time.

Secondly, we have reoriented our oyster research at Franklin City, Va., so that more time of our biologists is being devoted to the oyster-mortality problem in that area.

Third, we have brought expert oyster pathologists, including Dr. Sammy Ray from the Gulf of Mexico, and Dr. Reed Logie from Canada, to the Delaware Bay area for consultations regarding the causes of this mortality and the steps which might be taken to alleviate this situation.

Fourth, we have included an item of \$47,000 in our fiscal year 1960 budget for the beginning of a long-range investigation of the causes of this and similar shell-fish mortalities. In planning this program we have stressed the difficulty of this problem by comparing it to medical research on human diseases. In fact we have stated from the beginning that this investigation may require at least ten years.

Fifth, we expect to work cooperatively with each of the states involved in this problem to get the most for our research dollar and to reach a solution to this problem as rapidly as possible.

In addition to all this, the Service soon will have improved laboratory facilities in the Chesapeake area to permit expanded and more effective shellfish research by our personnel there. As a matter of fact, bids for the construction contract for the new laboratory at Oxford, Talbot County, on the eastern shore of the Chesapeake Bay in Maryland have been awarded.

This new site is in the center of the oyster-culture region and the salinity is high enough to permit us to run laboratory experiments in oyster culture which are not now possible in our present laboratory facilities. There are also few or no shellfish predators at this location.

STARFISH PREDATION: The starfish problem in Long Island Sound continues to be extremely important and here also the U.S. Fish and Wildlife Service is taking action in cooperation with the states to assist the industry.

When it became apparent that the 1957 year-class of starfish was unusually great, the first action by the Service was to call a meeting of the industry, state, conservation departments, and biologists to explore possibilities of assisting the industry. It appeared from these discussions that several problems were involved in the oyster crisis in the Long Island Sound area. Several storms had destroyed many oysters on the beds. Reproduction had been unsuccessful for a number of years. Oysters drills were numerous and caused heavy losses. And as a final straw, hordes of starfish appeared on the beds.

As a result of these meetings the second action by the Service was to increase the research fund of the Milford Laboratory by \$64,000 to attempt to find answers to these problems. Considerable progress has been made in these studies.

Third, the Service is cooperating with the States of New York and Connecticut in a joint program to determine the effectiveness of the present known methods of starfish control and to try to develop improvements in these methods. The research funds of the Milford, Conn., laboratory have been increased by \$20,000 to permit our participation in this program.

Fourth, we plan to continue the research program at Milford, Conn., to explore the possibility of new and improved methods for control of starfish and other oyster predators. We are particularly encouraged by the recent progress of this work, some of which has been reported upon.

OTHER SHELLFISH RESEARCH

The shellfish culture studies by the Milford staff are also continuing, aimed at the development of improved hatchery techniques, including means of providing preserved larval foods for oyster and clam hatcheries. Reports have been presented on the growth of some of the Connecticut laboratory-produced seed clams in Florida waters and investigations into the effects of turbidity on clam-egg development and clam-larvae growth.

Members of the Boothbay Harbor, Maine, laboratory staff are dealing with the clam predator problem involving green crab control. Barriers of trawl lines of chemically-treated fish baits are being field-tested by our personnel and by personnel of the Maine Department of Sea and Shore Fisheries.

Down at the Gulf Breeze laboratory in Florida, our scientists are also at work on important oyster research. They are exploring various possibilities of biological control of oyster enemies, employing parasites. They are also involved in basic research into the reactions of oysters to various factors in environment. In this investigation, they are working on an island situation where on one side there is fast oyster growth and on the other side slow growth.

I should also mention the research of the U.S. Bureau of Commercial Fisheries Beaufort Laboratory in North Carolina. For the past nine years, research has been carried on with the cooperation of the Atomic Energy Commission, looking into the accumulation of radioactivity by fish and shellfish from atomic explosions and other use of atomic energy. The purpose is to determine concentration factors

and rates of accumulation of radioactivity for various levels of pollution in order to determine adequate health standards. Although the A. E. C. support is to be decreased, the Bureau plans to continue and expand the studies.

Definitely, we are missing no bets as we expand our shellfish research programs. During the past year the Service sent two shellfish biologists to foreign countries to observe the progress in shellfish research there in order to determine if methods or techniques in use in those countries could be applied to increase the effectiveness of our research programs.

At Woods Hole Dr. Paul S. Galtsoff continues work on his book on "The American Oyster." This extensive compilation of our knowledge of the oyster is well along on its path to publication. Six chapters have been written and are now being reviewed. Other chapters are nearing completion and we look forward to publishing this valuable work in the near future.

This matter of publications is vitally important in the field of scientific investigation. Our personnel give it constant attention so that their coworkers in other agencies have the benefit of their findings at the earliest possible moment. During the past year alone, there have been a total of 21 papers published by the Service on shellfish studies alone. This good reporting rate reflects the high quality of our shellfish research effort.

A LOOK TO THE FUTURE

And now--let's look at the future. I have to say frankly that we do not have an easy path to follow. We're confronted by some difficult problems--especially the troubles caused by an excess of starfish and the as yet somewhat mysterious cause for oyster mortality which has crept into some of our important production areas.

These are problems which we're confident can be solved, but all research takes time. It can be speeded only when we achieve a maximum of efficient effort through well-coordinated, all-out cooperation.

Our field people have been particularly encouraged by the outstanding assistance they have received from the Long Island industry in the fight on the starfish problem. It has been so significant that it deserves a pat on the back.

I also want to pass along to you the conviction of our field men that they see similar help forthcoming from the industry elsewhere as the attack on the mortality problem becomes better understood and the opportunities to assist are more clearly recognized.

Working together, we're finding out the ways to make real progress on these problems of mutual concern. Following such a pattern, we are bound to attain our goal--methods of control of factors curtailing shellfish production so that excessive losses may be limited and a more stable industry assured.

I want to conclude with this thought: there is no substitute for the products of laboratory efforts. Progress in all industries is carved out painstakingly when you nurture basic and applied research. In this respect our shellfish work is setting a good example for other fisheries investigations.

And remember this -- it makes no difference where we do the research as long as it's done, for the findings can be applied to help you wherever there is a similar problem.



SODIUM CONTENT OF FISH

Is fish suitable for low-sodium diets: A chemist of the U.S. Bureau of Commercial Fisheries, Seattle, Wash., presented the following information on the sodium content of fish meat at the 42nd Annual Meeting of the American Dietetics Association in Los Angeles, Calif., on August 27, 1959.

Foods, to be acceptable for use in low-sodium diets, should contain considerably less than 0.1 grams of sodium per 100 grams of food, since some menus restrict the maximum daily intake of sodium to 100 milligrams. The majority of meat foods--including red meat, poultry, fowl, fresh-water fish, and salt-water fish-have values well below this limit.

Practically all fresh-water fish have a sodium content of 40 to 80 milligrams per 100 grams of meat with a general average of 59. The same average is found for most species of salt-water fish, and the range is about the same also. Their sodium content is usually lower than most fresh-water species.

Such factors as species, size, sex, and season of capture contribute to a wide variation in the sodium content of fish meat. But, the variations are not sufficiently large to prevent the use of fish meat in sodium-restricted diets.

Canned fish is usually salted to suit the average taste. This product has a sodium content of 600 to 800 milligrams per 100 grams. But the unsalted canned product is found to have practically the same sodium content as is found in fresh fish. The so-called "dietetic pack" may, therefore, be produced from all species commonly used for canning.

Although many factors contribute to variation in sodium content of fish meat, the values usually lie within the range of 40 to 80 milligrams per 100 grams, unless sodium has actually been added. Since large quantities of practically all species of fish are readily available that have not had sodium added, fish can be used in sodium-restricted diets to provide interest and variety.



STANDARD FOR FROZEN SALMON STEAKS

In the development of voluntary standards for fishery products, the U.S. Bureau of Commercial Fisheries technological group maintains an active liaison with its inspection and certification group. The standard that is developed and the inspection procedures therein must be practical from the inspector's standpoint and still realistically reflect the quality level of the product.

The laboratory work on a standard for frozen salmon sticks is essentially complete. It is likely that this standard will be in effect by the beginning of 1960.

After the completion of the written standard, the Bureau customarily carries out a grading survey to test the applicability of the standard. Based on the examination of 391 sample units (249 retail size units and 142 institutional size units) taken from processors' warehouses the following findings were noted:

- (1) The average point score for the retail size units was 82 points, and for the institutional-size units 88 points. These data indicated that the quality of the institutional size pack was significantly better than the retail-size pack.
- (2) The principal factor contributing to the Grade "B" and "Substandard" classification was flavor, primarily rancidity of the fatty portion.
- (3) The percentage glaze, free drip, and cook drip were not considered as factors of quality in grading of the frozen salmon steaks inasmuch as meaningful relationships could not be established.

An example of the close liaison maintained between the standards development and product inspection groups is demonstrated by the following:

The control of net package weights was found to be a serious problem in this survey. Our inspection personnel in following up on this problem during routine checking of net weight noted that the glaze water used in glazing salmon steaks was occasionally at some elevated temperature at the start of the steaking operation. As the steaking progressed, the temperature of the glaze water was continuously lowered until equilibrium temperature was attained. Adjustment for glaze pickup to meet net weight requirements if based on the initially warmer glaze water, resulted in underweights as the glaze water temperature dropped, due to the greater pickup of glaze at these lower temperatures. Thus, in order to control the percentage of glaze and thereby glaze allowance and net weight the inspector found it necessary to routinely check glaze water temperature in order to protect the processor against excessive overweights or underweights.



VALUE OF FISH-BODY OIL IN REDUCING CHOLESTEROL LEVELS

Relief for persons with high cholesterol levels in blood serum is indicated by oil research projects now under way. The findings are the result of a series of research projects on fish-body oil conducted by the U.S. Bureau of Commercial Fisheries Technological Laboratories and by the Hormel Institute of the University of Minnesota under a Bureau contract.

Bureau officials hope that their efforts will encourage clinical testing by responsible medical research staffs to evaluate the results obtained to date and to further explore the application of these results to conditions which may cause or aggravate atherosclerosis and kindred diseases. Bureau officials further state that the research has opened the way for the development of a food supplement composed of those fractions of fish oil which are the most effective in lowering the blood cholesterol level.

These discoveries were incidental to a Bureau basic research program to "take fish oil apart, molecule by molecule, and see just what it contains." Once the unique blood cholesterol depressent effects of fish oils were noted, research programs were inaugurated to explore them. Technicians state that there is still considerable basic research needed to fully explore the properties of fish oils.

The key findings of the research are (1) the abundance of what is known as "unsaturated" fatty acids in the body oils of many species of fish, and (2) proof that the

feeding of these "unsaturated" fatty acids to test animals reduced the cholesterol levels in direct proportion to the degree of unsaturation.

The term "unsaturated" in this instance applies to those fats in which there are carbon atoms which have not combined to the fullest possible extent and which are capable of uniting with certain elements or compounds to change the character of the fat.

A "saturated" fat, such as lard, congeals at low temperatures. An "unsaturated" fat does not congeal readily. This is the property which permits fish to move freely in waters of low temperatures.

Bureau research has shown that about half of the body oil of most species of fish is unsaturated and about 10 percent of it is highly unsaturated. This latter portion of the fish oil contains 5 or 6 unsaturated carbon atoms per "chain," compared with only two such atoms in vegetable oil. In other words the potential of fish oil in reducing the cholesterol level is approximately three times that of vegetable oils.

Second only to the Bureau findings that unsaturated fish oils readily reduce the blood cholesterol levels is the development of a method to separate the highly unsaturated 10 percent from the rest of the oil. It is this method which makes it possible to utilize only the essential part of fish oil in reducing cholesterol levels. Thus the patient would take only one-tenth of the calories contained in the whole oil.

The process of separating the unsaturated fatty acids from the rest of the oil requires some very definite conditions to maintain the value of the product and avoid possible toxicity, Bureau officials state, adding that this is another reason why the findings should be clinically tested.

Among the fish which have liberal amounts of body oils are salmon, mullet, mackerel, and herring. Menhaden is not now used as food fish but it yields considerable amounts of highly unsaturated oils.



COOKIES MADE FROM ALGAE

Cookies can be made from algae, the green scum that floats on ponds, Edith Katherine Schuele, a 15-year-old Memphis, Tenn., high school junior told the annual meeting here of the American Medical Association at Atlantic City, N. J.

Edith, who won the top AMA award at the National Science Fair in Hartford, Conn., in May, displayed at the meeting cookies, cinnamon pinwheels, French bread and cheese swirls that she made from algae.

The use of algae in foods, she said, increased the protein content 20 percent and the fat content 75 percent.

Edith said she grew the algae, spun it in a centrifuge, and heated it to obtain a powder. It tastes like broccoli, she noted.

Currently algae is being considered as a food that could be grown aboard rocket ships for space crews on their trips. One tablespoon of algae equals the nutritional value of one ounce of steak. (Food Field Reporter, July 20, 1959.)



Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 2--PACIFIC COAST DRUM TRAWLING:

Drum trawling, a relatively recent development, was introduced into the Pacific Northwest otter-trawl fishery in 1954 (Alverson 1959) following the development of drum purse-seining. The drum-trawling method can be adapted readily to the trawling system in conventional use on the Pacific coast, wherein the net is towed from davits located one on each quarter of the stern. No major modifications in net rigging are necessary to convert the trawl to the drum method. Patents covering some aspects of drum trawling have been applied for by the designers.

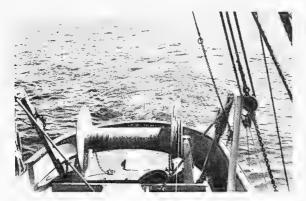


Fig. 1 - Otter trawl drum. The drive reel is on the port end of the drum. The drive wire, extending foreward, leads to the winch drum.

The principal unit of the system is the drum upon which the trawl is wound (fig. 1). It is constructed of sheet steel and is designed to accommodate a conventional otter trawl. Drum flanges are 4 to 5 feet in diameter and the drum core is 15 to 20 inches in diameter and 5 to 8 feet long. Stopper chains, for securing the trawl to the drum, are fastened near each end of the core (fig. 2). The drum

is powered either directly by an independent hydraulic or mechanical drive similar to that described for drum seiners (Smith 1954), or indirectly by means of a wire rope running from the main winch drum to a drive reel on the side of the trawl drum (fig. 3).



Fig. 2 - Stopper chain. A six- to seven-foot stopper chain is secured near each end of the core of the trawl drum. A snap is secured to the other end of the chain to receive the bridle.

Two methods are employed commonly for connecting the net to the doors in the Pacific Coast trawl fishery: (1) wires leading from the headrope and footrope of each side of the trawl are connected directly and separately to the doors



Fig. 3 - Setting the trawl. The drive wire, leading through the block in the foreground, is unwinding from the trawl winch onto the drum drive reel.

creating a net-door connection known locally as a "double dandyline;" or (2) the foreward end of the wire leading from the headrope is joined to the foreward end of the wire leading from the footrope of the same side to form a bridle, usually about 15 fathoms long, and the bridle is connected to the door by a 25-fathom single-wire section (ground wire) forming what is known locally as a "single dandyline." The chief difference between the use of double and single dandylines in drum trawling lies in the way in which the two are started onto the trawl drum: when a double dandyline connection is used, the trawl is started onto the drum at the wingtips; whereas when a single dandyline is used, the trawl is started onto the drum at the foreward end of the bridles. The following is a description of a trawl equipped with a single dandyline.



Fig. 4 - Drum stopper chains taking the strain of the gear. The trawl bridle can be seen leading to the net. The inset shows the snap at the end of the stopper chain connected to the end of the trawl bridle.

Setting the Gear: (1) The bag of the trawl is thrown overboard and the net unwinds from the trawl drum as the vessel moves ahead (fig. 3). (2) When the trawl and trawl bridle have been set the drum stopper chains support the strain of the gear (fig. 4). (3) At this time the dandylines are reeved through the towing blocks on the davits and secured to the ends of the trawl bridles (fig. 5); the strain is taken off the stopper chains with the winch, and the chains are disconnected. (4) Setting is then continued until the end of the dandyline is reached. the doors are hooked on in the conventional manner, and the set is completed

by slacking out the required amount of warp.

Picking Up the Gear: (1) The doors are hauled back to the davits and, in contrast with conventional trawling methods (Knake 1958), are completely disconnect-



Fig. 5 - The dandyline (on the other side of the fisherman) has been reeved through the davit towing block and connected to the trawl bridle. When the dandyline receives the strain of the gear, the stopper chain will be disconnected. Note the G-hook at the end of the dandyline.

ed from the dandylines -- this is facilitated by replacing the conventional "Kelly-eye" with a "G-hook." (2) The gear is hauled in until the foreward end of the trawl bridles appear. (3) The stopper chains are then connected. (4) The gear is slacked off slightly until the stopper chains take the strain of the trawl; and the dandylines are disconnected from the doors, removed from the trawling davits, and connected to the drum-drive wire. (5) The trawl is then started onto the drum (fig. 6). (6) When the trawl has

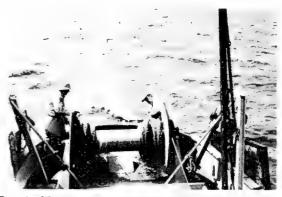


Fig. 6 - Winding the gear onto the drum. A "floater" of Pacific ocean perch can be seen in the background. The drive wire in the foreground is being wound from the drive drum onto the trawl winch.

been wound onto the drum as far as the intermediate trawl section, the portion of the trawl remaining in the water is lifted with a single-block lift, the fish bag is brought alongside by turning the vessel, and the splitting operation carried out in the usual way (figs. 7 and 8).

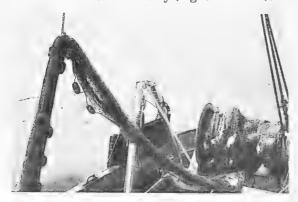


Fig. 7 - The fish bag alongside ready for splitting. Note how, after splitting, the intermediate trawl section and bag are wound directly onto the trawl drum without further handling or vessel maneuvering.

There are several advantages to drum trawling: the net can be handled much more rapidly and with less labor; the operation is safer because overhead handling of heavy gear is eliminated and



Fig. 8 - Splitting a 6,000-pound catch of Pacific ocean perch.

the amount of total handling required is reduced; the operation can be carried out more easily in rough seas; and the method helps prevent the partial escape of fish from the mouth of the trawl--a source of loss that is often serious with conventional methods of picking up the trawl.

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--By Fred Wathne, Fishery Methods and Equipment Specialist Branch of Exploratory Fishing and Gear Research Division of Industrial Research and Services, Seattle, Wash.

Note: Appreciation is extended to Capt. Louis Salveson of the drum trawler <u>Guide</u> for his cooperation in providing the opportunity to observe and photograph the drumtrawling technique.



Agriculture Yearbook Includes Story of Fish

Included in the recently issued U. S. Department of Agriculture Yearbook for 1959--Food--is the story of the U. S. Department of the Interior's activities relating to fish and the fishing industry.

The article is by A. W. Anderson, Assistant Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service. It deals with the food aspects of fish—the food which is hunted, not farmed—and the activities of the Department of the Interior in behalf of the fishing industry and in the interest of the consuming public.

The value of fish as a food is pointed out—a well-balanced protein with good percentages of several essential vitamins and with "unsaturated" acids of apparently considerable value in lowering the cholesterol level in the blood serum.

The standards of quality for several fishery products and the inspection serv-

ice which assures quality fishery products are described as services available to those fishery processors who want to display the Department of Interior shield of quality on the goods they offer to the householder.

There is a "purchasing guide" which explains the terminology of fishery products in simple language and numerous items of interest to the housewife about fish and shellfish.

After the discussion of fish as a food comes information on the activities of the Bureau of Commercial Fisheries in behalf of the fishing industry and the consumer of fishery products. Concisely told is the story of fishery statistics compiled by the Bureau and the dissemination of market information by the Fishery Market News Service which puts buyer and seller on an even footing on facts about supply and demand.

In 1957, the annual harvest of about 5 million pounds was worth \$351 million to the men on the boats; \$592 million at the processing level; \$836 million at wholesale level; and \$1,091 million to the retailers.

A chart shows that United States production is relatively stable but that the imports are definitely increasing; another chart shows the United States in second position, far behind Japan, in fish production and just barely ahead of mainland China and the U.S.S.R.

The interesting story of fishery biological research is told. Included is a reference to the three-Nation effort which is being made to learn enough about salmon to set up salmon management plans for countries in two hemispheres. The job is complex, for salmon is a fish which has a definite "home" for short periods in America or Asia at hatching and spawning times but otherwise is voyaging several thousand miles of ocean.

There is the story of the sea lamprey, the huge king crab, and the minute oyster crab, common and uncommon fish and shellfish, fishing equipment problems, distribution problems, the value

of fish meal in animal diets, and the value of fish oil in industry. There is material about exploratory fishing, gear research which helps the industry meet some of its technical and practical problems, and technological research which aims to make it possible for the consumer to get the best possible product.

In one place the article pays tribute to the United States fishing industry with "Our fishing industry is unusually independent. It prefers to pursue its own course with a minimum of governmental assistance or the exercise of Federal or State authority. There is no Federal legislation authorizing subsidies or price support or similar programs for fishery foods. The producers and consumers do benefit, however, from the research and similar services that the government provides for most industries."



American Fishery Advisory Committee

PROGRAMS AND PROBLEMS DISCUSSED AT 10TH MEETING:

The tenth meeting of the American Fisheries Advisory Committee was opened on October 7, 1959, at Old Point Comfort, Va. This advisory group was created under the terms of the Saltonstall-Kennedy Act of 1954 as amended in 1956. This legislation provides that an amount equal to 30 percent of the moneys received from import duties on fishery products shall be made available to the Secretary of the Interior to promote the free flow of domestically-produced fishery products in commerce by conducting a fishery educational service and fishery technological, biological, and related programs and to develop and increase markets for fishery products of domestic origin.

The meeting concentrated on fishery programs and problems of the Middle Atlantic and Chesapeake Bay areas. Discussing topics vital to the fisheries industry were representatives of the U.S. Bureau of Commercial Fisheries and Committee members.

Representatives of the Bureau pointed out that:

- (1) In the Middle Atlantic and Chesapeake Bay area fish and shellfish valued at \$61 million are landed annually--about 17 percent of the total value of all fish and shellfish landings in the Nation.
- (2) There are two species of whiting potentially abundant in the Middle At-lantic area not now exploited.
- (3) The three major problems of the oyster industry are the need for an increase in seed production; control of oyster predators; and the need to identify and control diseases of oysters.
- (4) A method has been developed based upon the effectiveness of a chemically-treated barrier of sand to protect oyster beds.
- (5) There has been progress reported on the team approach by the Government-Industry Cooperative Research Program to the problem of determining satisfactory definitions and standards of identity for raw oysters.
- (6) The sudden and large fluctuations in the supply of blue crabs needs research attention and a shift of effort from the shad investigation to the study of blue crab problems is scheduled.
- (7) In a report of progress in the processing of crab meat, it was revealed that tests proved that the boiling method of extracting crab meat yielded nearly nine percent more meat than did the steaming method. In terms of current production figures, this would provide an increase in gross value of crab meat of about \$1 million annually.
- (8) Various factors influence the important menhaden fishery-the effect of man-made changes in the estuarine nursery grounds, the make-up of menhaden populations, and the characteristics of the ocean environment that influence the behavior, distribution, and abundance of the fish; all these factors need to be studied.
- (9) The need to insure the future market for fish meal by a complete knowledge of the nutritional value of the product and a study of new market possibilities.

- (10) A chemical test has been developed for determining accurately the freshness of crab meat. This so-called picric acid turbidity test has been industry-tested successfully on shrimp. It reveals a departure from ideal freshness of the product even before changes in either the flavor or odor can be detected.
- (11) The economics of the fish-oil industry point up the need for better methods of processing, new products, and exploitation of recent studies of fish-oil fatty acids and their derived products. Progress has been made in the analysis of fishy odors leading to practical application of those studies.



American Samoa

American Samoa T	American Samoa Tuna Landings, January-September 1959									
Species	Septe	September		September						
opecies	1959	1958	1959	1958						
		. (1,00	00 Lbs.) .							
Albacore	2,077	1,716	15,284	15,450						
Yellowfin	322	313	3,430	4, 185						
Big-eyed	63	29	744	874						
Skipjack	_		4							
Total										
Note: Most of thes	Note: Most of these tuna were landed by Japanese vessels;									
a small amount b	y South F	Corean ve	ssels.							



Atlantic Estuarine Research Society Meets

The fall meeting of the Atlantic Estuarine Research Society, whose members are marine scientists from Massachusetts to Florida, met at Virginia Beach October 2-4, 1959, as guests of the Virginia Fisheries Laboratory.

Several fishery biologists of the Virginia Laboratory presented papers before the assembled scientists: (1) comparison on "condition indices" of oysters cultured in trays and those grown on natural bottoms; (2) the catch-rate changes in the salt-water sport fishery; (3) a review of the grey sea trout studies made in Virginia; and (4) Virginia's work on crab pot mesh size and its relation to catch.

A visiting shellfish biologist from the University College of North Wales pre-

sented a paper on the setting of barnacles.

This society, which is the only one in the United States devoted exclusively to the study of the problems of research in inshore marine waters along the Atlantic seaboard, meets in regular spring and fall session. Its membership consists of about 140 marine scientists.



California

PELAGIC FISH POPULATION SURVEY OFF COAST OF SOUTHERN AND CENTRAL

CALIFORNIA CONTINUED:

M/V "Alaska" Cruise 59A6-Pelagic Fish: The coastal waters of central Baja California from Magdalena Bay to Cedros Island were surveyed (July 24-August 11, 1959), by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to sample young sardines for determining the relative abundance and distribution of fish resulting from the 1959 spawning; (2) to sample adult sardines, Pacific mackerel, jack mackerel, and anchovies; (3) to collect live sardines for genetic studies conducted by the U.S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla; (4) to tag barracuda incidental to pelagic fish work; (5) to collect specimens as requested by other investigations; and (6) to troll for albacore while en route to Magdalena Bay.

Of the 68 light stations occupied, sardines were taken on 17, Pacific mackerel on 12, northern anchovies on 11, and jack mackerel on 6.

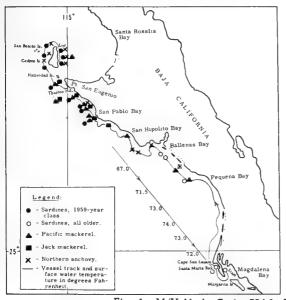




Fig. 2 - California Department of Fish Game's research vessel M/V Alaska.

Eleven of the 17 sardine samples were comprised of the 1959 year-class ranging in length from 80 to 115 mm. These fish were taken between San Pablo Bay and Cedros Island. Adult sardines were taken only in a small area between Ballenas and Pequena Bays. One sample of these fish produced a near running-ripe female which was the only female of a 50-fish sample. No live sardines were delivered to the Bureau's Laboratory at La Jolla due to insufficient quantities collected.

The Alaska scouted 396 miles and 44 pelagic fish schools were sighted. Of this total, 30 were identified as sardine, 6 as anchovy, and 8 were unidentified. Bioluminescence was adverse for good visual scouting during a large part of the cruise.

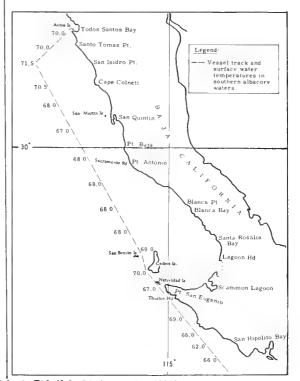


Fig. 1 - M/V Alaska Cruise 59A6 -- Pelagic Fish (July 24-August 11, 1959).

A total of 499 California barracuda was tagged with type "G" spaghetti tags at Asuncion Bay and Cedros Island. The fish were taken on barbless lures and held one day in the vessel's large live wells prior to tagging. All but 73 were released at Asuncion Bay.

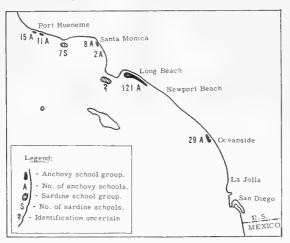
Livered crabs (<u>Pleuroncodes planipes</u>) requested by inland fisheries died before the vessel reached port. Specimens of marine organisms were collected for other investigations.

While en route from Ensenada to Magdalena Bay, a special offshore trolling track was followed to encompass previously productive albacore waters. No albacore were taken. Water temperatures were unfavorable for albacore.

Sea surface temperatures ranged from 60.8° F. (16.0° C.) at San Pablo Bay to 77.2° F. (25.1° C.) off San Juanico Point. In general, offshore differences were small from southern California south to Magdalena Bay. A range of 68° F. (20.0° C.) to 72° F. (22.2° C.) prevailed over the greater part of the cruise.

* * * * *

Airplane Spotting Flight 59-14-Pelagic Fish: The inshore area from the Mexican Border to Bodega Bay was surveyed from the air (August 10-13, 1959) by the Department's Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

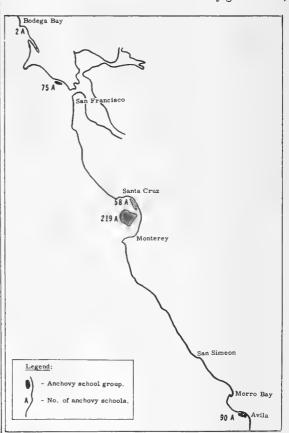


Hueneme and Point Mugu, and San Luis Obispo Bay contained 90 small, poorly defined schools, near the Avila piers. Of the 277 schools seen in Monterey Bay, 58 were in the extreme inshore area between Capitola and Aptos, and the remaining 219 were in the approximate center of the bay, showing up as medium to large sized, well defined spots. North of Monterey, 77 schools were seen, 75 close to the beach in Bolinas Bay and 2 just off the sandy beach at Bodega Bay.

On the afternoon of August 10 many "breezing"

groups containing 26 schools were present off Port

On the afternoon of August 10 many "breezing" schools of fish were seen three miles southeast of Pt. Vicente. They behaved like sardines, but were erratic and difficult to observe. At any given time,



Airplane spotting flight 59-14 (August 10-13, 1959).

Low clouds and haze hindered observations in some portions, but sufficient coverage was achieved during the four days to determine that pelagic fish schools were not plentiful in the inshore areas of southern and central California. Only 29 anchovy schools were observed south of Huntington Beach. These were loose and strung out, in very shallow water, five miles north of Oceanside. From Los Angeles Harbor to Huntington Beach, 121 schools were sighted. Of these, 61 were outside the Long Beach breakwater and one mile off Sunset Beach and Tin Can Beach. The remaining schools were small "breezing" spots centered one-half mile off the Belmont pier. Only 10 schools were found in Santa Monica Bay, all in shallow water very close to shore. Two small

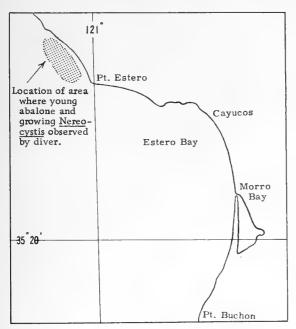
5 to 10 spots would be in sight but any one spot was visible for only a short period. On the same day, 7 small sardine schools were seen three miles south of Pt. Dume.

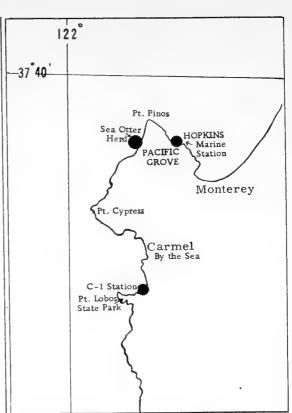
Note: Also see Commercial Fisheries Review, Sept. 1959, p. 22.

INVESTIGATION OF ABALONE RESOURCES CONTINUED:

M/V "Nautilus" Cruise 59N3, and Diving Boat
"Mollusk" Cruise 59M1-Abalone: The abalone investigations were continued from April 15-June 30,
1959, by the California Fish and Game Department's research vessel Nautilus and diving boat

Mollusk in waters off Monterey and Morro Bay. The objectives were (1) to establish stations and habitat improvement areas; (2) to investigate sea otter-abalone relationships; (3) to recover tagged abalone; (4) to investigate skin-diving activity and areas of commercial activity; and (5) to recover abalone spat.





Area covered by M/V Nautilius on Cruise 59N3.

Because of unusually rough weather, activities were seriously curtailed during almost the entire cruise. Diving was limited to one day in April, five in May and one in June. During April and May the investigation worked out of Monterey and Carmel, and in June operations were moved to Morro Bay.

One station (C-1) established in Carmel Bay was found to be well worked over by skin divers. Abalone left in the area were deep in cracks and crevices. Since this area is a popular spot for skin divers, especially club outings and classes, it should provide good information on the effects of skin divers during a year's time.

Dives were made off Pacific Grove south of Pt. Pinos in a cove inhabited by 20-25 sea otters. Because of rough water and poor visibility it was not possible to cover the entire area, but from limited observations it was apparent that this small sea otter herd had eaten almost all the abalone in the area.

Recovery was made of three abalone tagged in 1956 off Hopkins Marine Station. None of these animals had grown during the two years they had been at liberty. All were found within a few feet of the point of release.

Because of the weather it was not possible to set out equipment for the recovery of abalone spat nor was it possible to examine the areas of former commercial abalone fishing between Monterey and San Simeon. During June, weather conditions were such that only three boats of the commercial aba-

lone fleet remained at Morro Bay. By the latter part of the month even those had given up. The abalone investigation was able to make only one dive during June. However, two encouraging observations were made. Many small and sublegal (less than 8 inch) red abalone (H. rufescens) were found in the area north of Pt. Estero and a considerable growth of young kelp (Nereocystis) was observed on the bottom in that area.

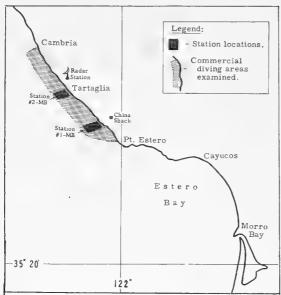
Although attempts were made to reach the diving areas whenever weather conditions permitted, it was not possible to conduct operations with any degree of safety or accuracy and attempts had to be abandoned.

Diving Boat "Mollusk" Cruise 59M2-Abalone: Investigations were continued in Morro Bay from August 12-31, 1959, by the Department's diving boat Mollusk to (1) establish abalone stations to be used for observation and study; (2) observe condition of abalone on commercial diving areas; (3) set out abalone spat collectors; and (4) conduct habitat improvement experiments.

Two experimental stations were established in commercial diving areas. Each station encloses an area roughly one-half by three-quarters of a mile extending from shore out to 100 feet. One station is located off what is known locally as the Second China Shack; the other is located south of the radar station off the Tartaglia ranch.

Three days were spent inspecting the grounds from Pt. Estero to Cambria in an attempt to as-

sess the condition of commercial areas. Encouraging signs were (a) the re-establishment of the



M/V Mollusk Cruise 59M2 (August 12-31, 1959),

kelp beds (Nereocystis) which had been almost completely absent for two years; and (b) the large number of sublegal (below 8 inches in diameter) red abalone (Haliotis rufescens). Abalone appeared to be feeding on the new kelp and new growth was apparent on several shells. This is in marked contrast to observations made last year when almost a complete lack of growth was found.

Two types of abalone spat collectors were fabricated and a set of each was placed in the two station sites. One consisted of abalone shells strung on a wire 15-feet long and suspended from floats; the other was made by enclosing 40-50 abalone and oyster shells in a chicken-wire basket. At each station, three float collectors and two bottom collectors were set out in water 15- to 35-feet deep ranging from 200 to over 600 yards offshore. One bottom collector was lost and could not be recovered.

Although inspection of the shells after approximately two weeks in the water revealed no young abalone, it was felt that this method of collection has value and should be tried again in the spring. Setting apparently did not occur at this time.

Because of the limited diving weather it was not possible to conduct habitat experiments.

Note: Also see Commercial Fisheries Review, April 1959, p. 37.

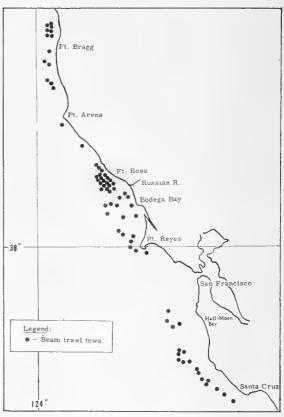
SHRIMP STUDY OFF CENTRAL AND

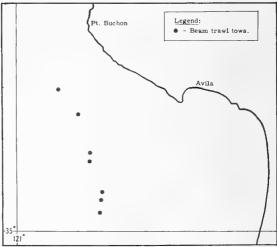
NORTHERN CALIFORNIA COAST CONTINUED:

M/V "N. B. Scofield" Cruise 5985-Shrimp: The coastal waters off central and northern California from the vicinity of Ft. Bragg to the vicinity of Avila were surveyed by the California Department of Fish and Game research vessel N. B. Scofield from August 1-31, 1959, for stocks of ocean

shrimp (Pandalus jordani) both inside and outside the 3-mile limit. Other objectives were: (1) to determine size, sex, weight, and count of shrimp from different beds; (2) to determine size and weight of incidental fish catches; (3) to make bathythermograph casts to obtain temperatures in shrimp fishing areas; and (4) to collect specimens requested by other investigations.

A total of 86 tows was made with a 20-footbeam trawl. This included 14 tows in Area B-1 from Ft.





M/V N. B. Scofield Cruise 59-S-5 Shrimp (August 1-31, 1959).

Bragg to Pt. Arena, 64 tows in Area B-2 from just south of Pt. Arena to Santa Cruz and 8 tows in Area C off Avila. Depths ranged from 32 to 135 fathoms.

Tows made within the 3-mile limit around Bodega Bay and the Russian River failed to produce shrimp. Shrimp were found in limited concentration off Ft. Ross between 52 and 60 fathoms. Best tow in Area B-2 was at Ft. Ross where 71 pounds of shrimp per hour were caught. Quite a few shrimp of the year (approximately 400 individuals about 5 months old) were caught in a half-hour tow off Sander's Reef-just south of Pt. Arena. They averaged about 8.5 millimeters (about $\frac{1}{3}$ -inch) in carapace length. This was the best representation of the 1959 year-class taken in all the tows. No larger shrimp were present. A total of 19 tows from the Farallon Islands to Santa Cruz failed to produce shrimp.

The bed of shrimp in the Ft. Bragg area was in good concentration within a depth range of 60 to 72 fathoms and coastwise for 4.5 miles. The two best tows produced 500 pounds each in a half-hour of trawling. Efforts to find the shrimp where the commercial fleet had left them in July produced negative results. Apparently they had shifted south about 4 miles but had maintained about the same depth.

Shrimp were found off Avila in limited concentration between 83 and 114 fathoms. Best towhere yielded about 120 pounds in a half-hour.

Samples of shrimp were obtained from 4 tows off Ft. Bragg, 11 off Ft. Ross, and 7 off Pt. San Luis. One hundred shrimp from each of these tows were sexed and measured. In addition, the entire contents of the gallon sample were counted and weighed.

The catch of incidental fish was comparatively light due to the use of a small unweighted foot rope. Counts and average weight of all species from 78 tows were recorded. In addition, all fish taken in 8 of the tows were measured. The biggest tow of fish weighed about 60 pounds. Two best shrimp tows contained only about 2.3 and 3.4 pounds of fish each. Pacific sand dabs (Citharichthys sordidus), slender sole (Lyopsetta exilis), juvenite rockfish (Sebastodes sp.), tomcod (Microgadus proximus) and juvenile hake (Merluccius productus) were the major constituents in the catches. Sand dabs accounted for most of the poundage while hake accounted for the greatest total number.

Forty-six bathythermograph casts were made in depths ranging from 47 to 75 fathoms. Casts were made in all areas where shrimp were caught and also in areas where shrimp were not taken.

Vessel thermograph and surface temperatures were recorded during all tows for the entire cruise. Temperatures ranged from 53.4° F. off Ft. Bragg on August 14 to 61.9° F. off Half-Moon Bay on August 23.

Note: Also see Commercial Fisheries Review, July 1959, p. 25.

Canned Fish

CONSUMER PURCHASES, AUGUST 1959:

Canned tuna purchases by household consumers in August 1959 were 965,000



cases, of which 54,000 cases were imported. By type of pack, domestic-packed tuna purchases were 199,000 cases solid, 613,000

cases chunk, and 100,000 cases grated or flakes. The average purchase was 2.0 cans at a time. About 31.3 percent of the households bought all types of canned tuna; only 2.0 percent bought the imported product. The average retail price paid for a 7-oz. can of domestic solid or fancy was 35.2 cents and for a $6\frac{1}{2}$ -oz. can of chunk 27.5 cents. Imported solid or fancy was bought at 29.7 cents a can. August purchases were lower than the 998,000 cases bought in July by 3.2 percent; retail prices in most cases were slightly higher.

During August household consumer purchases of California sardines were 34,000 cases; and 23,000 cases imported sardines. The average purchase was 1.6 cans at a time for California sardines and 1.9 cans for imported. Only 1.4 percent of the households bought canned California sardines and 1.7 percent imported. The average retail price paid for a 1-lb, can of California sardines was 24.5 cents, and for a 4-oz. can of imported 26.2 cents. Retail prices were higher for California sardines but slightly lower for imported canned sardines. August purchases of California sardines were lower than the 36,000 cases bought in July by 5.6 percent.

Canned salmon purchases in August 1959 were 201,000 standard cases, of which 104,000 cases were pinks and 53,000 cases reds. The average purchase was 1.2 cans at a time. About 14.2 percent of the households bought all types of canned salmon; 6.9 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 56.5 cents and for red 87.0 cents. August purchases were down about 6.9 percent from the 216,000 cases bought in July.



Canned Foods

SURVEY OF MOVEMENT OF CANNED FOODS BY METHOD OF TRANSPORTATION:

A survey of canned food movement covering a period of one year ending June 30, 1958, has been released by the Bureau of the Census, U. S. Department of Commerce. The survey was underwritten by the Association of American Railroads. Data were compiled by nine commodity class groups: prepared meats; milk; fish and shellfish; fruits; seasonal vegetables; nonseasonal vegetables; juices; soups, baby foods, and jellies; and specialties. The movement was measured in tons and straightline tonmiles by four types of transport: rail, "for hire" motor carrier, private truck, and other. "Other" included predominantly intercoastal water and freight forwarder. The survey covered only commodities of domestic plants.

It is estimated that 349,000 tons of canned fish were transported at an average-haul of 1,318 miles. This average is longer than that for any other commodity. The next closest-average is for fruits with 866 miles. Milk, with 385 miles had the shortest average-haul. The average-haul for all commodities was 548 miles. When considering average-haul by type of transport, fish had the longest average-haul by rail of 1,676 miles. The average-haul by rail of all commodities was 765 miles. By motor carrier, fish had next to the shortest average-haul of 213 miles (milk had the shortest). Of all canned goods, 45 percent of the tons originated go by rail, 27 percent by "for hire" motor carrier, 23 percent by private truck, and 5 percent by other means. Of all canned fish, 62 percent of tonnage originated go by rail, 21 percent by "for hire" motor carrier, 7 percent by private truck, and 10 percent by other means. Packers of prepared meat haul 39 percent of their traffic in their own trucks.



Central Pacific Fishery Investigations

OCEANOGRAPHIC AND FISHERY SURVEY IN HAWAIIAN WATERS COMPLETED:

M/V "Charles H. Gilbert" Cruise 46: During a 30-day cruise that ended on October 17, 1959, the U. S. Bureau of Commercial Fisheries research vessel, the Charles H. Gilbert, completed an oceanographic and fishery survey in Hawaiian waters. This cruise was one of a series being conducted by the Bureau's laboratory in Honolulu to learn more about the skipjack tuna and the waters in which they live.



U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert.

The biologists believe that season skipjack are associated with a certain type of water, an extension of the California Current, and that the success of the Hawaiian summer fishing season may depend on the time of entry and amount of this water in the Hawaiian area. Unlike the summer months when the entire Island chain was surrounded by the California Current Extension and when numerous tuna schools were sighted close to land, the cruise just completed showed that the higher salinity water from the North Pacific had moved in and only a few fish schools were sighted.

Although very few skipjack schools were fished, the Field Party Chief reports that the vessel was able to successfully fish one school of medium size (10-18 pounds) skipjack using tilapia as bait. The tilapia is a tropical fish species which was introduced in

Hawaii several years ago as a possible supplement to the nehu, a less hardy native bait species.

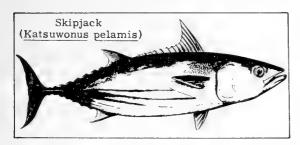
In addition to the oceanographic and biological surveys, underwater movies were taken of skipjack during fishing operations. The Honolulu laboratory is the first to successfully record on film the behavior of the skipjack in their natural environment. These records will be studied in order to understand more fully the behavior of the tunas.

During the cruise flagline fishing was carried out and net tows were made to determine the kinds and abundance of marine animals to be found in the various types of ocean water encountered during the cruise.

* * * * *

SKIPJACK TUNA LANDINGS IN HAWAII INCREASE ACCORDING TO PREDICTION:

In March 1959 a prediction was made by the fisheries biologists of the U.S. Bureau of Commercial Fisheries' Honolulu Laboratory that the 1959 landings of skipjack tuna in Hawaii would be better



than those for an average season. Landings (preliminary figures) for the first 9 months of 1959 amounted to 9.8 million pounds as compared with 8.6 million pounds landed in a similar period of 1958. Thus, it seems that the prediction was essentially satisfied. By the method of prediction it would have been anticipated that both the 1957 and 1958 landings would fall substantially below normal, and such was the case; the 1957 landings through September were 5.2 million pounds and those of 1958, 6.4 million pounds. As the prediction was based on environmental

changes alone, a look at some of the characteristics of the stock of skipjack available to the Hawaiian fishery was suggested. The first characteristic chosen for such study was the pattern of the distribution of fish sizes in the landings at the Honolulu tuna cannery.

In a normal fishing season, the livebait fishermen purposely bypass schools of the smaller skipjack in order to fish the more preferred size, the 18-22 pound fish. The larger, 28-32 pound fish are less desirable as they are "two-pole fish," and two-pole fishing has the effect of reducing the number of fishermen by one half.

The skipjack fishery in Hawaiian waters is seasonal with the bulk of the annual landings made between May and September and with a peak as a rule during July. A large percentage of the fish caught during these months are normally 18-22 pounds (70-75 cm.) with lesser weights of small fish, 4-8 pounds (45-55 cm.) and of large fish, 28-32 pounds (80-83 cm.). During the off-season the majority of the skipjack landed at the Honolulu cannery consist of the smaller 4-8 pound size.

Beginning in August 1959 length measurements of skipjack were taken onboard fishing vessels during unloading at the Honolulu cannery. Some 25 fish from each of the schools identifiable in the catch were measured. Other data, such as numbers of schools sighted, the number consisting of small fish and not fished, the area of catch, were recorded for each vessel.

The results to the end of September show a distribution of size among the catch that is different from previous observed distributions. A group of fish from 24 to 31 pounds in weight dominated the catch during August and September, as compared with an expected dominant group at 18-22 pounds. Furthermore, the middle-size group, normally 18-22 pounds, was represented during August by a group from 11-16 pounds and during September the mode for this group could not be identified. The small-size group was present in about the expected proportions.

Although data are very inadequate as yet, it is interesting to speculate on the reason for these results; 1958 was a poor season. If this resulted from low availability, i.e., the "season fish" (18-22 pounds) were elsewhere, these fish would not have been removed from the population and, thus, one year later (1959), would dominate. Another possibility is that there was a comparatively low survival of eggs and larvae during the natal year of the 1959 "season fish," in turn resulting in a low abundance of those fish in Hawaiian waters in 1959. Several years' additional length frequency data, along with additional corollary life history, migration, and environmental data are necessary before it will be possible to do more than speculate concerning the causes of these yearto-year variations in size groups.



Crabs

FUTURE BLUE CRAB RESEARCH PROGRAMS DISCUSSED AT VIRGINIA MEETING:

The Blue Crab Committee of the Atlantic States Marine Fisheries Commission, with representatives from Maryland, Virginia, North Carolina, South Carolina, Florida, and the U. S. Bureau of Commercial Fisheries, met during the week of September 14, 1959, at the Virginia Fisheries Laboratory, to discuss future blue crab research to be conducted by Federal, state, and private agencies along the Atlantic coast.

Maryland packers have been greatly concerned by the scarcity of crabs in their section of the Chesapeake Bay all summer. They question whether the present laws are in harmony with the findings of research biologists. Although Virginia packers have not handled as much crab meat this year as in some previous years, they do not believe that this summer's crop has been much below average.

The Committee unanimously recommended that future biological investigation of the blue crab be directed at ascertaining the causes for these serious

fluctuations in abundance. For a number of years, biologists at the Virginia Laboratory have been studying the hydrographic, biological, and other factors which affect the survival of larval and juvenile crabs both in Chesapeake Bay and its many tributaries.

One of the outstanding needs of the scientists is to be able to measure accurately the marketable crop produced from each year's spawning. In order to do this, they must determine the size, sex, and age composition, and the spawning history of crabs in the commercial catch. They must also be able to measure the amount of effort required to catch a definite number of crabs.

Virginia's marine laboratory is currently carrying on an extensive tagging program to determine the movement of crabs within each river system and also the movement of crabs from one river to another or to the Bay. The chief crab biologist at the Virginia Fisheries Laboratory stated: "We are extremely interested in discovering the contribution made by the stocks of crabs in the Rappahannock, York, James, and Back rivers to the winter crab fishery which develops out in the Bay each winter. This information, along with knowledge gained from other areas of research, will permit a better understanding of population fluctuations, and permit us to predict the future abundance of crabs. Research now in progress will also provide information on which to base corrective measures."

Records of the commercial catch indicate that there have been wide fluctuations in the number of pounds of crabs landed each year, but since 1929 the total catch landed in Virginia has exceeded 30 million pounds 12 times. The best catch was in 1950 when over 50 million pounds of crabs were marketed. Although the average year's catch falls below the 30 million mark, crab fishermen have a tendency to remember the good years and think of them as being average. Thus, their concept of average is usually too high.

Fisheries Loan Fund

LOANS APPROVED THROUGH SEPTEMBER 30, 1959:

As of September 30, 1959, a total of 624 applications for fisheries loans totaling \$20,432,430 had been received. Of these, 338 (\$8,161,863) have been approved, 228 (\$6,328,063) have been declined or found ineligible, 51 (\$2,280,556) have been withdrawn, and 19 (\$3,001,089) are pending. Several of the pending cases have been deferred indefinitely at the request of the applicants. Sufficient funds are available to process new applications when received.

The following loans have been approved between July 1 and September 30, 1959:

New England Area: Boat Fairhaven Corp., New Bedford, Mass., \$49,000; Charles S. Mitchell, Jr., Vinalhaven, Maine, \$2,000; Peter Condelli, Medford, Mass., \$25,000; Risdal & Anderson, Inc., New Bedford, Mass., \$47,500.

South Atlantic and Gulf Area: Harry E. Robinson, Key West, Fla., \$5,000; Clyde J. O'Daniel, Key West, Fla., \$7,441; Billy Jay Brown, Long Beach, Miss., \$12,000; Frank W. Scott, Brownsville, Texas, \$14,000; H. J. & C. J. Eymard, Cut Off, La., \$19,805; T. Irvin Knowles, Key West, Fla., \$5,290; Everglades Shrimp Co., Everglades, Fla., \$19,645; W. D. Henderson, Rockport, Texas, \$24,000; Ralph R. Combs, Marathon, Fla., \$9,062; Pioneer Shrimp Co., Tampa, Fla., \$32,000; M. L. Frakich, Aransas Pass, Texas, \$40,000.

California: Ove A. Holm, Morro Bay, \$2,500; Carl Hanken, et al, San Diego, \$80,000.

Pacific Northwest Area: Mrs. Anna Ancich, Gig Harbor, Wash., \$34,137.

Alaska: Vernon Eckman, Juneau, \$1,250; Peter G. Olsen, Kodiak, \$9,000.

Hawaii: M. Hamabata & S. Tokumine, Honolulu, \$10,000.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PUR-CHASES, JANUARY-SEPTEMBER 1959:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.8 million pounds (value \$0.9 million) of fresh and frozen fishery products were purchased in September 1959 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in August by 16.8 percent, but was 4.7 percent higher than the quantity purchased in September 1958. The value of the purchases in September this year was higher by 7.6 percent as compared with the preceding month and up 2.0 percent from September 1958.

Table 1 - Fresh and Frozen Fishery Products Purchased by the Military Subsistence Supply Agency, September 1959 with Comparisons

-1	L	_						
ı		QUANTITY				VAL	UE	
ì	Septe	mber		Sept.			Jan,-	
ł	1959	1958	1959	1958	1959	1958	1959	1958
ı		.(1,000	Lbs.)			. (\$1	,000) .	
1	1,758	1,679	17,488	17,875	924	906	8,973	10,204

During the first nine months of 1959, purchases amounted to 17.5 million pounds (valued at \$9.0 million)—a decrease of 2.2 percent in quantity and 12.1 percent in value as compared with the first nine months of 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in September averaged 52.6 cents a pound, about 11.9 cents higher than the 40.7 cents paid in August, but 1.4 cents less than the 54.0 cents paid during September 1958.

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces in September 1959. In the first nine months of 1959, purchases of canned tuna were down about 36.4 percent, canned

Table 2 - Canned Fishery Products Purchased by the Military Subsistence Supply Agency, September 1959 with Comparisons

		QUAN	TITY		VALUE				
Product	Septe	mber	Jan	JanSept. S		September		ept.	
	1959	1958	1959	1958	1959	1958	1959	1958	
		(1,00	00 Lbs.)		(\$1,00		000) .	0)	
Tuna	370	461	2,502	3,931	162	1/	1, 159 إ	1/	
Salmon.	3	1	18	1,402	3	1/	14	1/	
Sardine .	4	-	974	93	1	I/	144	1/	
Totals	377	462	3,494	5,426	166	1/	1,317	1/	
1/Unava	1/Unavailable.								

salmon down 98.7 percent, but canned sardine purchases were up tenfold from the same period of 1958. The sharp drop in the purchases of canned salmon from January-September this year is not significant as heavy purchases of this item are usually made in the month of October.

Note: Armed Forces installations generally make some local purchases not included in data given; actual total purchases are higher because it is not possible to obtain

local purchases.



Fish Meal

QUICKLIME PROCESSING METHOD DEVELOPED:

A process in which fish meal is prepared from fish or fish waste with the addition of quicklime or slaked lime has been developed. The amount addednot more than 10 percent of the weight of the fish material used—is sufficient to convert the hydrophilic protein material to a gel.

A batch of fish is loaded into a hopper and carried to the inlet of a mill by a conveyer belt. The material receives 5 percent by weight of quicklime from a container with a controllable outlet valve while it is on the conveyer. The mixture is ground down to pass through a 2-in. (5.1-cm.) mesh, the resultant paste thus obtained being transferred to a drying yard, where it is spread out in thin layers and stirred once or twice to accelerate the drying. When dried, it is ground to the required particle size. Oil may be recovered from the fish by solvent extraction before the addition of the lime. It is claimed that this method gives a light-colored, pleasant-smelling product which is relatively cheap to produce (Food Manufacture, Feb. 1958).



Frozen Fish

REFRIGERATED TRUCK HAULING COSTS MAY INCREASE:

Some indication of operating problems in connection with the proposed frozen food code of the U. S. Association of Food

and Drug Officials of the United States is already at hand. A prominent motor carrier handling fresh and frozen fishery products in the Pacific Coast States has proposed rate increases on frozen fish from the Pacific Northwest to California. The reason given for the requested increases is that excessive costs of maintaining low temperatures (0° F. or lower at all times) on frozen fish make it more expensive to handle.



Fur Seals

ALASKA FUR-SEAL SKIN HARVEST IN 1959 LOWER:

The fur-seal industry, operated by the U. S. Department of the Interior's Bureau of Commercial Fisheries, began its annual sealing season on the Pribilof Islands, Alaska, on June 27 and ended on August 20, 1959. The Pribilofs normally supply about 80 percent of the world's annual production of fur-seal skins.



Fur seals swimming.

Soon after the season opened, it was evident that 3-year-old seals, which usually make up most of the harvest, were arriving at the Islands in numbers far below normal expectations. The shortage of this year-class became more pronounced as the season advanced. At the conclusion of the sealing operations, only 58,251 skins had been obtained as compared with 78,919 skins harvested in 1958.

The low incidence of 3-year-old animals in 1959, which can be at least partly explained by a record loss of new-born pups on the Islands in 1956, points to a corresponding shortage next year in the appearance of 4-year-olds. A relatively

low loss of young seal pups on the Pribilofs during the summer of 1957, however, gives promise of a more nearly normal harvest of 3-year-old fur seals in 1960.

* * * * *

PRICES FIRM FOR ALASKA FURSEAL SKINS AT FALL AUCTION:

At the semi-annual auction sale of Alaska fur-seal skins held in St. Louis, Mo., on October 23, 1959, a total of 24,018 fur-seal skins were sold for \$2,479,441, for the account of the United States Government. The skins are the product of the sealing operations of the U. S. Bureau of Commercial Fisheries on the Pribilof Islands.

The annual production of the Pribilof Islands is divided, under treaty, 70 percent to the United States and 15 percent each to Canada and Japan. The United States and Japanese skins, plus lesser quantities of South African and South American skins, all processed and ready for use in garment manufacturing, are disposed of at sales each spring and fall.

Of the three shades of skins auctioned, skins dyed black sold at an average of \$109.17, whereas matara (brown) dyed skins brought \$99.85, and kitovi (midnight blue) brought \$97.65 a skin. The average for all United States skins was \$103.23 per skin as compared with an average of \$101.46 for the Japanese-owned skins, \$44.99 for South African skins, and \$51.42 for skins from Uruguay.

Although the average price for United States-owned skins was the highest on record (the average of the previous sale on April 10, 1959, was \$99.71½), the prices reflected a slight decline grade for grade. The unusually good quality of the offerings sold at this auction caused the average to be somewhat higher.

1/Revised.

Note: Also see <u>Commercial Fisheries Review</u>, January 1959, p. 30 and June 1959, p. 35.



Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY SMELT FISHING IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 5: During the period August 27-September 6, 1959, the U. S. Bureau of Commercial Fisheries chartered vessel Active continued exploratory smelt fishing operations in Eastern Lake Erie.



Fig. 1 - Smelt catch from Lake Erie made by M/V Active.

Thirty tows were completed between Fairport Harbor, Ohio, and Sturgeon Point, N. Y., in depths of 5-25 fathoms



Fig. 2 - Another large catch of smelt from Lake Erie made by M/V Active.

using a 50-foot two-seam balloon trawl with a $1\frac{1}{2}$ -inch mesh cod end. Catches ranged from trace amounts to 600 pounds of large smelt per hour. Mixed catches also produced small amounts of burbot, white suckers, and whitefish. Best fishing results were obtained in the 10-13 fathom depths north of Dunkirk, N. Y., and northwest of Erie, Pa.

Large surface schools of emerald shiners were observed daily. Small mid-water echo traces off Dunkirk, N. Y., were unidentified. No seine sets were attempted.

Surface temperatures equaled previously recorded high temperatures for eastern Lake Erie (79.5° F.). Bottom temperatures ranged from 41° F. at 25 fathoms to 76° F. at 5 fathoms. Thermal stratification continued well defined throughout the Eastern and East Central basins.

Note: Also see <u>Commercial Fisheries Review</u>, October 1959, p. 26 and November 1959, p. 35.



Great Lakes Fishery Investigations

WESTERN LAKE ERIE BIOLOGICAL RESEARCH CONTINUED:

M/V "George L." Cruise 7: The U.S. Bureau of Commercial Fisheries research vessel George L. participated in a cooperative survey of oxygen conditions in the Central Basin of Lake Erie in September and continued investigations on young-of-the-year yellow pike (walleyes). Preliminary compilations of trawl catches during a 3-day study of fish populations in one area during August were completed.

Normal dissolved oxygen conditions were present in waters of the Western Basin covered by the George L. during the August cruise. Severe oxygen depletion was, however, observed near the bottom in late August in the Central Basin during surveys by the Ohio Division of Wildlife and Ontario Department of Lands and Forests. A cooperative synoptic survey of dissolved oxygen concentrations in the Central Basin was undertaken in early September to determine the degree and extent of oxygen depletion.

No oxygen was found near the bottom in water 40 feet deep at one station 5 miles north of Sandusky Harbor. Severe oxygen deficiencies of less than 3 parts per million were found in the hypolimnion, which often extended 20 feet above the bottom, in Canadian and United States waters from Sandusky and Wheatley east to Port Stanley and Fairport. Samples of fish and bottom organisms were taken at several locations to compare with samples taken in past years.

Young yellow pike began to appear in trap-net and seine catches of commercial fishermen in the Western Basin. By the end of September these fish averaged about nine inches long and one 10.5-inch fish was observed. The trawling survey of the George L. showed that these young yellow pike are now found in all waters of the Western Basin. They feed on spottail minnows, emerald shiners, and young yellow perch.

Intensive around-the-clock trawling at 3 stations, on 4 consecutive days (July 27-30), by the George L. and Madtom near East Harbor was conducted to determine variations in trawl catches over a short period of time. Fifty 10minute tows captured 174,966 fish of various species. The numbers of youngof-the-year fish taken were: yellow perch 102,450; spot-tail shiner 53,990; trout-perch 3,097; sheepshead 1,713; white bass 1,277; white crappie 659; gizzard shad 339; yellow-pike 79; carp 59; smelt 33; and one each of bullhead, muskellunge, and silver chub. Only 11,267 fish one year old or older were captured and most of them were adult spot-tail shiners and trout-perch. In a period of less than 2 days, the trawl catch of youngof-the-year yellow perch at one station varied from 14 to 19,250 fish per 10minute tow. During the first 48 hours of trawling, 952 fish in good condition and of various sizes and species were finclipped and returned to the water where they were captured. Only 12 of these fish were eventually recaptured in the trawl hauls. Only 9 percent of the perch 23 percent of the sheepshead, and 21 percent of the bullhead stomachs contained fish.

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WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 6: Studies were conducted (Sept. 14-21, 1959) by the U. S. Bureau of Commercial Fisheries research vessel Siscowet in Presque Isle Bay of Stockton Island, east of Oak Island, east of Outer Island, west of Outer Island, and southeast of Cat Island. The objectives were to observe the vertical distribution of the various types of chubs (Leucichthys sp.) and to locate young-of-the-year lake trout, whitefish, menominee whitefish, and lake herring (L. artedi).

Oblique gill-net sets were made over known chub grounds to determine the vertical distribution of the various species of chubs. Five $2\frac{1}{4}$ -inch (stretched measure) gill nets were fished obliquely from the surface to the bottom at 286 feet. All of the <u>L. kiyi</u>, 60 percent of the <u>L. zenithicus</u>, and 15 percent of the <u>L. hoyi</u> were nearly or entirely ripe.

A gang of five nets $(2\frac{1}{4}$ -inch) was set east of Outer Island on a steep bank in water from 20 to 66 fathoms. This set was made to measure the bathymetric distribution of the various species of chubs. All of the <u>L. kiyi</u>, 80 percent of the <u>L. zenithicus</u>, and 3 percent of the <u>L. hoyi</u> were nearly or entirely ripe.

Trawl tows were made at various depths west of Outer Island and southeast of Cat Island. The catches consisted mainly of ninespine sticklebacks, trout-perch, slimy muddlers, and smelt. One young-of-the-year lake trout was captured at 25 fathoms west of Outer Island. A very few young-of-the-year whitefish, menominee whitefish, and lake herring were also captured.

Practically no fish were captured above 18 fathoms in trawl tows made east of Oak Island. A heavy northeast sea the previous day apparently swept the grounds and forced all species into 20-30 fathoms where small numbers of lake trout, pygmy whitefish, L. hoyi, ninespine sticklebacks, smelt, and slimy muddlers were taken.

Surface water temperatures varied from 62.7° F. in Presque Isle Bay to 56.3° F. west of Outer Island.

M/V "Siscowet" Cruise 7: Environmental conditions were studied (Sept. 28-Oct. 7) at three index stations located (1) southeast of Stockton Island, (2) northeast of Bear Island, and (3) east of Pike's Bay. In addition to the fishery and environmental studies at the index stations, trawling operations were conducted west of Outer Island in search of young-of-theyear lake trout, whitefish, menominee whitefish, and lake herring. A six-hour limnological survey was conducted northeast of Bear Island to measure environmental changes which may occur during the day.

Trawl tows were made and standard gangs of gill nets were fished at each index station. Water, plankton, and bottom samples were collected in addition to observations of water temperatures, Secchidisc readings, and currents.

Very few of the chubs (Leucichthys sp.) appeared ready to spawn as compared to a high percentage of ripe chubs captured at other locations in the Appostle Island area during cruise 6.

Trawl tows southeast of Stockton Island took mainly trout-perch, ninespine stickleback, slimy muddlers, and smelt. Small numbers of lake trout, lake herring, pygmy whitefish, and L. hoyi were also taken.

Trawl tows northeast of Bear Island took many slimy muddlers and ninespine sticklebacks. One hundred <u>L. hoyi</u> and two <u>L. zenithicus</u> were also captured.

Trawl tows east of Pike's Bay took 633 smelt, 203 L. hoyi, with lesser numbers of whitefish, lake trout, trout-perch, slimy muddlers, ninespine stickleback, and burbot.

Trawl tows west of Outer Island were made at depths ranging from 6 to 27 fathoms. The most striking catch was three young-of-the-year (age-group O) lake trout taken in one 15-minute tow in water 17 to 21 fathoms. Other age-group O fish taken included 7 whitefish, 7 menominee whitefish, and about 40 smelt. Eight female pygmy whitefish caught at 27 fathoms appeared to be ripe. There were no males captured. Large numbers of trout-perch, ninespine sticklebacks,

and slimy muddlers were taken at this location.

The environmental survey northeast of Bear Island (29 fathoms) consisted of the collection of plankton and water samples, bathythermograph casts and Secchidisc readings over a six-hour period. The studies began at 1130 (EST) and were repeated at 1330, 1530, and 1730.

Surface water temperature varied from 55.8° F. east of Pike's Bay to 53.3° F. northeast of Bear Island. Bottom temperature varied from 54.0° F. at Pike's Bay to 41.7° F. northeast of Bear Island.

Note: Also see <u>Commercial Fisheries Review</u>, Nov. 1959, p. 36.

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SURVEY OF EASTERN LAKE SUPERIOR CONTINUED:

M/V "Cisco" Cruise 5: Experimental fishing and limnological studies were continued in eastern Lake Superior by the U.S. Bureau of Commercial Fisheries research vessel Cisco. The areas of operation during August 11-25, 1959, were from Marquette, Mich., to Whitefish Bay, and northward to Michipicoten Island.

Standard gangs of gill nets were set at 25, 50, 75, and 100 fathoms off Grand Marais. The catch at 25 fathoms included 26 lake trout, many lake herring, and very few chubs (Leucichthys sp.). A



fair catch of <u>L</u>. hoyi and <u>L</u>. reighardi and 3 lake trout were in the 50-fathom set. <u>L</u>. kiyi was abundant at 75 fathoms and a few <u>L</u>. hoyi, <u>L</u>. reighardi, and <u>L</u>. zenithicus were represented. A very light catch at 100 fathoms included 16 <u>L</u>. kiyi, 2 lake herring, and 1 round whitefish. The last-mentioned species had not been previously reported from that depth.

Catches from standard gangs of gill nets set at 25, 35, 50, and 70 fathoms in Whitefish Bay indicate an appreciably larger population of \underline{L} . hoyl as compared with the Grand Marais area. This species dominated the cátch at 25 fathoms, and together with \underline{L} . reighardi made up most of the catch at 35, 50, and 70 fathoms. The catch at 70 fathoms, however, was very light. Small numbers of \underline{L} . nigripinnis and \underline{L} . zenithicus were caught at the shallower depths. Smelt were common at 25 fathoms, afew deep-water sculpins were caught at 70 fathoms and 2 lake trout were caught at 35 fathoms.

A standard gang of gill nets with 3,600 feet of large mesh ($3\frac{1}{2}$ to 6-inch) added was set 25 miles southwest of Michipicoten Island in 50 fathoms.



Lake trout were fairly abundant (41 caught) and chubs were scarce. A 7-pound male siscowet, the only one of this subspecies taken, appeared to be ripe.

Yellow perch and round whitefish were very abundant in a very shallow $(2-3\frac{1}{2}$ fathom) gill-net set just outside Munising Bay. Round whitefish and white suckers were numerous in a shallow (5 fathoms) set inside the Bay. The deepest set in the Bay $(33-35\frac{1}{2}$ fathoms) produced numerous whitefish and L. hoyi, and a few smelt, burbot, L. nigripinnis, alewives, and lake trout.

Trawling at various depths (14-20 fathoms) in Shelter Bay caught the first young-of-the-year (age-group 0) lake trout (2.3 inches) this year.



Cottus cognatus was generally abundant and occasional catches were made of ninespine stickleback and pygmy whitefish.

Twenty-seven of the 78 lake trout caught at various locations were tagged and released.

Extreme temperatures of 9.4° C. (48.9° F.) and 20.0° C. (68.0° F.) were recorded at the surface. The surface of the water was warming at all areas. Regular limnological stations off Grand Marais (45 fathoms) and in Whitefish Bay (70 fathoms) were visited.

M/V "Cisco" Cruise 6: The Cisco surveyed (September 2-14, 1959) the Marquette-Keweenaw Bay area, repeating for the most part work of cruises 2 and 4 to observe possible seasonal changes in fish distribution and abundance.

Standard gangs of gill nets were set overnight at 15 fathoms in Shelter Bay; 20, 25, 35, and 50 fathoms off Marquette; 25, 35, 50, and 80 fathoms in Keweenaw Bay; and for two nights at 75 and 100 fathoms off Marquette.

Five lake trout were caught in Shelter Bay, 16 off Marquette (4 at 20 fathoms, 9 at 25 fathoms, and 3 at 35 fathoms), 4 in Keweenaw Bay (3 at 25 fathoms and 1 at 35 fathoms). Nineteen lake trout were marked with "spaghetti" tags and released.

Chub (<u>Leucichthys</u> sp.) catches off Marquette were, as in cruise 4, very light at 25 fathoms (11 taken), and rather light at 50 fathoms (73). The chub catches at 35 fathoms (125), 75 fathoms (484), and 100 fathoms (203) were noticeably heavier than similar ones made during cruise 4, even allowing for the fact that in cruise 6 the sets at 75 and 100 fathoms were for two nights. <u>L. reighardi</u> and <u>L. hoyi</u> constituted the bulk of the catches except at 75 fathoms where <u>L. reighardi</u> and <u>L. kiyi</u> were



most important, and at 100 fathoms where \underline{L} . \underline{kiyi} made up 93 percent of the catch.

In Keweenaw Bay the chub catches were appreciably lighter than during cruise 4, except at 80 fathoms, where the reverse was true. A total of 36 chubs was taken at 25 fathoms, 154 at 35 fathoms, 134 at 50 fathoms, and 62 at 80 fathoms. L. hoyi



predominated at 25 fathoms (55 percent of catch), 35 fathoms (93 percent), and 50 fathoms (76 percent). L. kiyi was somewhat more numerous than L. hoyi at 30 fathoms. L. reighardi was the second most numerous chub at the 3 shallower depths. Other species caught in the gill nets were L. nigripinnis and L. zenithicus (small numbers in most sets), lake herring (105 weighing 93 pounds in Shelter Bay, few elsewhere), smelt (198 at 20 fathoms off Marquette), burbot (commonest in the shallow sets), longnose suckers, whitefish, and round whitefish (a few of the latter 3 species in Shelter Bay only).

Trawls were towed at various depths from 14 to 42 fathoms in Shelter Bay, 7 to 21 fathoms near Traverse Island in Keweenaw Bay, and 25 to 42 fathoms off Pequaming in Keweenaw Bay. Only four young-of-the-year lake trout were caught in Shelter Bay, as compared with as many as a dozen or more per 10-minute tow taken by the Cisco in the same area during 1953. Only one other age-group O lake trout had been caught previously this year. The Shelter Bay drags also took moderate numbers of slimy sculpins, a large number of ninespine sticklebacks at 38-42 fathoms (few at other depths), and an occasional L. hoyi (deeper tows), smeltfry, and pygmy whitefish. Trawl catches off Traverse Island in Keweenaw Bay were similar to the shallower tows in Shelter Bay, except that there were no lake trout. Eight, 7 to 10-inch, lake trout were taken off Pequaming in Keweenaw Bay, all of them hatchery reared. Otherwise the catch composition was about the same as in the deeper tows in Shelter Bay.

Hydrographic stations in Shelter Bay, off Big Bay Point, and in Keweenaw Bay were visited for the third time this year. Surface water temperature generally cooled from about 18° C. (64.4° F.) at the beginning of the cruise to about 15° C. (59.0° F.) at the end. In Keweenaw Bay, however, strong southwest and west winds created an upwelling which temporarily resulted in surface water temperatures of only 5.2° to 10° C.(41.3° to 50.0° F.) over nearly the entire Bay. Extremes

during the cruise were 5.2° C. and 19.3° C. $(41.3^{\circ}$ and 66.7° F.)

Note: Also see Commercial Fisheries Review, Nov. 1959, p. 37.



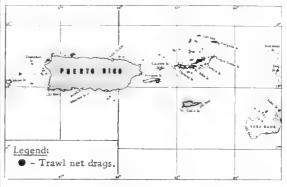
Gulf Exploratory Fishery Program

EXPLORATORY TRAWLING FOR SHRIMP OFF PUERTO RICO AND VIRGIN ISLANDS:

M/V "Oregon" Cruise 62: Extremely poor shrimp trawling conditions were found to exist in the Puerto Rico-Virgin Island area during a 31-day cruise (ended October 17) made by U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. Sixty-six exploratory shrimp trawl drags were made in depths of 17-380 fathoms to evaluate the shrimp stocks of the area.

Approximately 2,000 miles of depthrecorder transects were made over the 300-mile area in an attempt to locate clear bottom, with little success. On the shelf (inside of 50 fathoms), coral, rock, and sponge were encountered on every drag. The "slope" beyond 50 fathoms abruptly drops to 300-500 fathoms in most areas, with rock and coral as principle bottom constituents. Sixteen trawls were torn up during the survey and minor gear damage occurred on most of the remaining drags. Trawling stations were made in all locations that depth-recorder tracings indicated a slight hope of getting the gear back.

Pink spotted shrimp were found in small numbers in 30-45 fathoms along the northern edge of the shelf. Drags of



M/V Oregon Cruise 62 (September 16-October 17, 1959).

5-10 minutes would produce up to two pounds of shrimp (size 26-30 and 41-45 shrimp to the pound). Longer drags in this depth range resulted in gigantic sponge catches or tear-ups.

A very restricted smooth area in 150-300 fathoms off Aguadilla, Puerto Rico, was explored for royal-red shrimp. Not a single specimen was caught, although the smaller deep-water shrimp, Penaeopsis megalops (usually associated with royal-red shrimp in the known areas), was present in small numbers. Elsewhere, deep-water trawling produced only a small number of another species of penaeid shrimp (Aristaeus).

Eight drags were made along the northern edge of Saba Bank in depths of 19-380 fathoms. The only shrimp caught were 5-count scarlet shrimp in 360-380 fathoms at a rate of about 10 pounds per hour.

Small numbers of red snappers were caught in most successfully retrieved drags from inside of 50 fathoms. Other food fish were absent in the catches. Depth-recorder tracings indicated the presence of small school fish in several locations north of the Virgin Islands, hovering over bottom that was impossible to trawl with the gear on hand.

Numerous large schools of tuna were observed along the northeastern edge of the shelf. Several trolling captures yielded blackfin tuna ranging from 3-16 pounds each. All of these fish had been feeding on small Spanish sardines (Sardinella anchovia). In Mona Passage, scattered large tuna were observed on one occasion.



Inspection of Fishery Products

CRAB MEAT FIRST FRESH FISHERY PRODUCT UNDER CONTINUOUS INSPECTION:

Tentative approval was granted recently to a crab-meat processing plant in Brunswick, Ga., for use of the U.S. Department of the Interior (USDI) continuous inspection shield on unfrozen crab meat. This marks the first use of

the shield on products not protected by frozen storage during transporting and marketing.

The success of this venture depends on adequate handling and rapid turnover to prevent quality deterioration while the shield remains on the package. It is believed that adequate handling is now being practiced commercially on crab meat to an extent which will allow the use of the shield.

* * * * *

LOT INSPECTION SERVICES EXPANDED:

Lot inspection of fishery products is now available through the Bureau of Commercial Fisheries, U. S. Department of the Interior, in the following cities: St. Petersburg Beach, Fla.; Brownsville, Texas; New York, N. Y.; Boston, Mass.; Bellingham and Seattle, Wash.; and San Francisco, Calif. Requests for inspection service or information on both lot and continuous inspection services offered by the U. S. Bureau of Commercial Fisheries may be obtained through the inspectors located in these cities.

Inspection criteria include Federal, State or company specifications as well as the official U.S. Department of the Interior's Standards for grades of processed fishery products. Bids and purchase specifications requiring Government inspection and certification of fishery products should state "USDI Inspection and Certification Required." The inspector may be requested to certify the product lot as to (1) quality or grade, (2) conditions, or (3) quality and condition, following his examination. In addition, the inspector may be requested to check the loading and to provide an official certificate of loading for a specific lot of fishery products being shipped. The grade certificate and stamp "Officially Sampled" in conjunction with the date on the shipping cases constitute an assurance of the quality of the product when it was forwarded. The costs of these inspection services average \$6 per hour, including travel time from the office.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, WINTER-SPRING 1959/60:

Civilian per capita consumption of fishery products in the winter-spring of 1959/60 is expected to be about the same as the year-earlier rate. Consumption of frozen products may be up a little; the rate for canned fish will be lower. Retail prices of frozen fishery products well into spring 1960 are expected to average somewhat lower than the relatively high ones which prevailed from fall 1958 to early spring 1959, but those of canned fish will be a little higher.

Supplies of edible fishery products are expected to be somewhat lower through early spring 1960 than a year earlier. More of the frozen commodities will likely be available than a year earlier, but supplies of fresh fish will be seasonally light until next spring. Because of reduced output in 1959, supplies of the seasonally-packed major canned fish (principally salmon, Maine sardines, and California sardines) will be lower than a year earlier at least until the 1960 packs start moving to market after mid-1960. Output of canned tuna in 1959 was slightly below the record 1958 pack, but tuna is packed on a year-round basis.

Imports of fresh and frozen fish and shellfish in the next several months will likely be close to the year-earlier high level, but those of canned fish may be lower. Exports of edible fishery products from the United States through mid-1960 will likely be smaller than in the same part of 1958/59 because of reduced supplies of canned salmon and California sardines (pilchards).

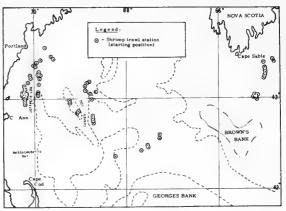
This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's November 5, 1959, release of The National Food Situation (NFS-90).



North Atlantic Fisheries Exploration and Gear Research

GULF OF MAINE SHRIMP STOCKS SURVEYED:

M/V"Delaware" Cruise 59-11: Commercial concentrations of ocean pink shrimp (Pandalus borealis) were found in the deep water areas surveyed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware in the Gulf of Maine.



M/V Delaware Cruise 59-11 (September 8-17, 1959).

During the September 8-17, 1959, cruise 71 drags were made in the Gulf and off Nova Scotia. The areas surveyed ranged in depth from 75 to 160 fathoms and included a number of mud-bottom basins. A standard 40-foot Gulf shrimp trawl was used as sampling gear on 66 of the exploratory tows. Five drags were made with a standard 100-foot Gulf shrimp trawl in the Jeffreys Ledge area. The most productive area was found to be west of Jeffreys Ledge in 90 to 105 fathoms where the best catch yielded 35 pounds of shrimp. The existence of a widely scattered shrimp population in the western part of the Gulf of Maine was indicated by small quantitites of shrimp in most of the drags. The shrimp averaged 34 per pound (heads on). A high percentage of the shrimp were egg-bearing females.

On several drags, small red crabs (Gervon sp.?) were abundant; collections of these and other fish and crustaceans (including shrimp) were made by Bureau personnel and cooperating scientists from Boston University.

Bottom temperatures were taken at selected stations. Drift bottles were released in cooperation with the Woods Hole Oceanographic Institution.



Ocean Currents

COAST AND GEODETIC SURVEY INITIATES STUDIES OFF NEW ENGLAND COAST:

The U. S. Coast and Geodetic Survey is releasing nearly 2,000 drift bottles in the Atlantic Ocean off the New England Coast to determine the direction of the currents in that area.

Each of the plain soda pop-type glass bottles released from the survey ship Hydrographer contains two cards. One card requests the finder to "BREAK THIS BOTTLE" so the finder can readily remove the cards and explains the purpose of the operation. The other is a small postpaid form asking for the date and location of the bottle when found.

All 2,000 bottles will be released from 10 to 35 miles offshore between the eastern tip of Long Island, N. Y., and Boston, Mass. They are part of a large-scale study of ocean currents and the date and place of release of each bottle will be on file at the Coast and Geodetic Survey's Washington office.

Survey officials hope to have a large percentage of the cards returned although some bottles may find their way via the Gulf Stream to the European side of the Atlantic. As an added incentive for the return of the cards, the finder will be told where the bottle he found originated. The card informs the finder, "You can add to the knowledge of ocean currents by returning the addressed card with the requested information. . . You will receive by return mail, information as to where this bottle was released. Your cooperation in giving accurate information will be of great assistance.'



Oysters

LONG ISLAND SOUND SPAWNING AND SETTING OF OYSTERS AND STARFISH:

Observations on the occurrence and distribution of bivalve larvae, in general, and oyster larvae, in particular, have been continued. Contrary to the healthy condition of the oyster larvae reported previously, those collected on August 27 at one station were of dull color and looked unhealthy. Empty larval shells were also found in the plankton. The only mature larvae found on that date were at one station where there were four in a 200-gallon sample. At the station where the heaviest oyster setting was recorded at that time, no mature and only three immature straight-hinge larvae were observed. (Bulletin No. 5, dated September 11, of the Fishery Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Milford, Conn.)

Since June 27, the number of larvae in the plankton samples has remained small. On September 3 only a few were found at two stations, while at one station there were only 24 bivalve larvae, of which none were oysters. In view of the heavy setting at the latter station at that time, the absence of oyster larvae in the samples seems peculiar. A possible explanation of this phenomenon is that the larvae are brought to this point by currents only for brief periods. A continuous collection of samples at the station during 24-hour periods may offer an explanation although, in the past, such attempts did not help much in clarifying the enigma.

The plankton samples collected on September 8 showed a comparatively large number of bivalve larvae at one station, although only one mature oyster larva was found there. In other areas bivalve larvae were not numerous and oyster larvae virtually absent.

It is clear that this year two stations in the Milford area seem to be receiving the heaviest sets. Unfortunately, because of a prevalence of starfish and drills, this section has been virtually abandoned and, as far as we know, no cultch to receive the new set has been planted there. However, because of the promising new chemical method for the control of starfish and drills, which is now under development at our laboratory, we hope to help the industry re-convert this area into productive seed oyster beds. Experiments along these lines have been carried on by the Bureau, some of them in close cooperation with the Connecticut Shell Fish Commission, for quite some time and the results will soon be reported. Several of the largest oyster companies of Connecticut and New York have also offered their cooperation in these studies.

Setting of starfish continues, but is extremely light. The young starfish that set earlier in the summer have grown in inshore areas to considerable size and are capable of attacking the oysters of last year's set, but in Long Island Sound proper, probably because of a lack of food, many of the starfish appear emaciated.



South Atlantic Exploratory Fishery Program

EXPLORATORY SURVEYS FOR NEW FISHERY RESOURCES INITIATED:

A search for new fishing grounds and for species of commercially-valuable fish and shellfish along the South Atlantic coast between North Carolina and Florida was started on August 31, 1959. This is a part of the U. S. Bureau of Commercial Fisheries program of charting potential marine resources as a means of insuring continuous supplies of fishery products.

The project now under way was endorsed for several years by the Atlantic States Marine Fisheries Commission. It has finally materialized through an allocation of about \$150,000 for this fiscal year (1960) from funds provided by the Saltonstall-Kennedy Act of 1954, as amended by the Fish and Wildlife Act of 1956.

The exploratory fishing vessel Silver Bay, a 96-foot steel-hulled New Englandtype trawler equipped with modern electronic navigational and fish-detecting devices, is being used in the survey. The vessel, transferred from the Gulf of Mexico after a two-year red snapper trawling survey, will be based at Brunswick, Ga., for the duration of the program. Brunswick was chosen as a base of operations due to its central geographical position, deep-water port facilities, convenience of cooperation with the Bureau's Fishery Biological Laboratory there, and the resultant savings that can be expected through joint administrative services.

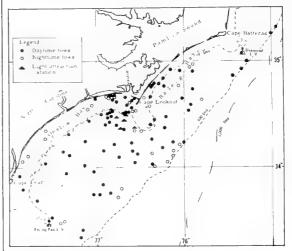
In formulating the operational program, the immediate needs of the commercial fishing industry in those areas have been taken into consideration. Exploratory operations for the present will place primary emphasis on a 5-50 fathom depth range. The cruises will be arranged, insofar as possible, to permit seasonal coverage for all areas. Special effort will be made to determine the availability of shrimp and fish steaks beyond the range of present fishing.

A staff of 3 fishery exploration specialists and 9 skilled fishermen man the vessel. General program and operational supervision is by the Chief, Gulf Fisheries Exploration and Gear Research Section, Bureau of Commercial Fisheries, Pascagoula, Miss.

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CONTINENTAL SHELF OFF NORTH CAROLINA COAST SURVEYED:

M/V "Silver Bay" Cruise 18: A 29-day exploratory trawl survey of the continental shelf off the coast of North Carolina was completed on October 2, 1959, by the U. S. Bureau of Commercial Fisheries chartered trawler Silver Bay. This work, which was proposed by the Atlantic States Marine Fisheries Commission, is a continuation of the East Coast exploratory program that was initiated in 1957 and is designed to gather additional information concerning the offshore fishery potential of the continental shelf be-



M/V Silver Bay Cruise 18 (August 31-September 25, 1959).

tween Cape Hatteras, N. C., and Cape Canaveral, Fla. The exploratory operation is temporarily based at Brunswick, Ga., to coordinate the exploratory work with the oceanographic research that has been in progress for the past five years at the Bureau's Brunswick Biological Laboratory.

During the trawl survey, 76 day and 33 night exploratory tows were completed

in the 5- to 100-fathom depth range between Cape Hatteras and Cape Fear, N. C. Major effort was expended in the 5-50 fathom depth range between Cape Lookout and Cape Fear at the request of the North Carolina Fisheries Association. Six night-light attraction stations were completed between Cape Lookout and Cape Fear.

Trawling operations were conducted with both shrimp and fish trawls rigged with chain and/or rollers on the foot rope, and fished with standard V-D bridles and ground cables. Tickler chains were used whenever bottom conditions permitted. The shrimp trawls were constructed from 2-inch stretched mesh webbing throughout the body and cod end, and with few exceptions were fished with loop-chain foot rope. The fish trawls were constructed from $4\frac{1}{2}$ inch stretched mesh webbing in the frame and body and 2-inch webbing in the 150mesh extension and cod end. The fish trawls were roller-rigged from wing tip to wing tip. Bracket doors (8 feet x 46 inches) were used to spread the trawls.

In general, bottom conditions throughout the area were found to be suitable for trawling with the exception of isolated patches of coral, which though not suitable for shrimp gear, presented no problem to the roller-rigged gear. Though minor tear-ups were experienced in some areas, no gear loss or significant damage occurred.

SHRIMP: Brown shrimp (Penaeus aztecus, 21-25 count) were taken in both day and night tows in the 5-8 fathom depth range between Beaufort and Bogue Inlets. Individual tows in this area produced between 5 and 35 pounds of headsoff shrimp per hour. Only scattered individuals were taken west of Bogue Inlet in this depth range. Approximately 45 tows completed in the 10-50 fathom depth range between Cape Fear and Cape Lookout failed to produce catches of brown shrimp.

Large pink shrimp (Penaeus duroarum, 15-20 count) were caught between Beaufort Inlet and Cape Lookout in the 6-10 fathom depth range, but none were taken beyond the 10-fathom curve. Brown and pink shrimp were notably absent from all tows east of Cape Lookout. Night-light attraction stations failed to attract concentrations of shrimp or fish.

Though rock shrimp (Sicyonia sp.) were present in nearly all tows no catches of commercial importance were made.

The results of this phase of the survey strongly suggests that no fishable concentrations of shrimp are to be found beyond the range of the existing fishery during this season.

FISH: Moderate to heavy concentrations of fish consisting mainly of small spot (Leiostomus xanthurus), croakers (Micropogon undulatus), porgy (Stenotomus sp.), and butterfish (Poronotus tricanthus) were located in widely separated areas. Exploratory tows in the 5-12 fathom depth range between Cape Lookout and Cape Fear produced mixed catches of fish at the rate of 2,000-3,000 pounds per one-hour tow. Beyond the 12-fathom curve, production of fish ranged from less than 100 pounds to a maximum of 600 pounds per hour tow.

Between Cape Lookout and Cape Hatteras moderate catches of small-market fish or noncommercial varieties of fish (up to 1,000 pounds per hour) were taken in depths ranging from 10 to 30 fathoms.

Moderate to heavy concentrations of small butterfish were located at $35^{\circ}20^{\circ}$ N. and $74^{\circ}56^{\circ}$ W. in 85 to 105 fathoms. One tow of less than one hour with the $4\frac{1}{2}^{-}$ inch mesh fish trawl resulted in a catch of 1,800 pounds of butterfish. Fair catches of squid (Loligo pealii, up to 500 pounds per hour) also were taken in this area in 75 to 95 fathoms. Some difficulty was experienced in working this area due to the extremely steep slope of the shelf.

SCALLOPS: Of special interest was the discovery of large calico scallops (Pecten gibbus) in 17 to 20 fathoms southeast of Core Banks. From 1-3 bushels of these scallops were taken in shrimp trawls. The scallops, which measured approximately 3 inches across the shell, yielded approximately $2\frac{1}{2}$ quarts of meats per bushel. Taste and texture were excellent and compare favorably with the bay scallop (Pecten irradians). No attempt was made to define the extent of

the bed due to the lack of suitable gear. Modified "George's Bank" type scallop dredges will be used on the next cruise in this area to determine the commercial potential.

OTHER FINDINGS: In many areas the vessel's fish finder indicated heavy concentrations of bottom fish. However, trawl sets made on these indications suggested that the traces were made by dense schools of small anchovies (Anchoa sp.) too small to be caught in significant quantities with the existing gear.

Numerous schools of surface fish were observed almost daily and were tentatively identified as thread herring (Opisthonema oglinum) and menhaden (Brevoortia sp.).

Surface trolling was conducted at intervals between stations and resulted in the capture of six "false albacore" (Euthynnus alletteratus) and one white skipjack (Katsuwonus pelamis).

Heavy ground swells preceding Hurricane "Gracie" interrupted the cruise plan and precluded any attempt at surveying the broken bottom area where red snapper were discovered by the research vessel Delaware in February 1958.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JULY-SEPTEMBER 1959:

Leased Seed Oyster Areas Surveyed: Because of the increased importance of seed oysters, field surveys of three areas in polluted grounds leased from the State for the production of seed oysters was made during this quarter. An area of 45 acres in Jasper and Beaufort Counties on the New and Wright Rivers was examined in mid-August. As yet the lessee has made no attempt to plant cultch for seed oyster production. The area seems well suited for this purpose. At present there are less than 10,000 bushels of oysters within the area.

Another seed lease in the Stono River area (Charleston County) was surveyed.

This area is about in the same general condition as the above. It is capable of producing seed oysters, but there are relatively few in the area now. Intensive cultivation is needed for seed production.

The third area, on the edge of Charleston Harbor, was examined during the latter part of August. Here some 400 bushels of seed had been grown on cultch in wire baskets in June and July. In this 50-acre lease the extent of seed oyster production is limited only by the amount of cultch which can be placed overboard. About 200 bushels of large oysters were removed from this area in September for replanting under special permission of the State Health Department.

There are other seed oyster leases yet to be surveyed. More and more polluted grounds and bottoms which have not been in commercial production of oysters are being leased for seed production. Five oystermen, new to the oyster business in South Carolina, have now either leased or have applied to lease seed oyster grounds.

Shrimp Research: The 50 regular trawl hauls made during July-September 1959 indicated that brown shrimp were only slightly less abundant than during the same period of 1958. White shrimp, on the other hand, were just about twice as numerous.

Under the new Coastal Fisheries Laws which went into effect in May 1959, the Chairman of the Wildlife Resources Commission, on recommendation of Bears Bluff Laboratories, was given greater authority in opening and closing certain sounds and inland waters to shrimp fishing. As a result, from early July through mid-August, the Laboratories' 40-foot survey boat and its crew were constantly busy checking the size of shrimp in those areas. Consequently, three large sounds in South Carolina which ordinarily would not have been opened to shrimp fishing until August 15, were opened 19 days earlier.

Continuous reinspection of the sounds and inland waters indicated that St. Helena Sound needed to be closed again 14 days later because the large shrimp had disappeared and the shrimp in the sound

were generally too small to be marketed profitably.

This opening and closing of restricted areas after studies made by Bears Bluff Laboratories is a step in the direction of good fisheries management, but because of the large areas involved, the considerable distances to be traveled by the research vessel, and the small staff, it imposes considerable strain on the Laboratory in order to keep abreast of this and its other work.

Crab Research: In August, two biologists from the U.S. Bureau of Commercial Fisheries at Beaufort, N.C., together with personnel and crew of Bears Bluff Laboratories, tagged 973 blue crabs in the vicinities of Charleston Harbor and the North Edisto River. As of mid-September only 12 tags had been returned; all from nearby the area of release. Perhaps the lapse of more time will indicate whether the movement of blue crabs in summer is different from that observed in the winter by this Federal-State cooperative tagging program.

Pond Culture: Two experiments being carried out in the salt-water ponds were terminated suddenly on the morning of September 29 when Hurricane Gracie produced tides sufficiently high to completely sweep over the pond dikes. Although there was no structural damage, it will be impossible to tell whether the shrimp and fish in the pond came in or washed out with these hurricane tides.



Sponges

NATURAL SPONGE INDUSTRY TO BE FEATURED IN FILM;

The signing of a contract with the Sponge and Chamois Institute for the production of an industry-sponsored sound-color film which will feature the United States natural sponge industry was announced October 8, 1959, by the U. S. Department of the Interior.

The contract provides that the Bureau of Commercial Fisheries, Fish and Wildlife Service, will produce and distribute

the film. Tarpon Springs, Fla., home of the natural sponge industry in the United States, will be the locale of the picture.

Tarpon Springs is a community of Greek-American sponge fishermen. It is rich in the tradition of an old and colorful industry. Filming will start on Epiphany, the day upon which the sponge season traditionally opens with religious and festive ceremonies. Scenes will include sponge divers in action, underwater shots of the sponge colonies, and the picturesque wholesale sponge market. The picture will be 14 minutes in length and will be available on a free loan basis. The production is being financed by the natural sponge industry.

The natural sponge has several specialized uses. About one fourth of the output is used by the pottery industry. Professional painters, decorators, and cleaners use about half of the annual production. Householders and various amateur users take the rest.

The industry was established in Tarpon Springs in 1849. Its peak production was 486,000 pounds in 1936. A blight which started in 1938 and which persisted for a number of years all but ruined the resource. In recent years sponge production has been increasing.



Standards

PROPOSED STANDARDS FOR FROZEN RAW HEADLESS SHRIMP REVIEWED AT MEETINGS:

Four open meetings were scheduled in October and November for full discussion of possible grade standards for frozen raw headless shrimp. The National Fisheries Institute Technology Division arranged these meetings in order to assure expeditious development of practical standards through effective industrygovernment cooperation. On the basis of its recent canvass of the industry, the Technology Division recommended to the U. S. Bureau of Commercial Fisheries that an attempt be made to develop these standards. Bureau technologists compiled a first draft for consideration by The use of the standards the industry.

for grading samples of frozen shrimp were to be demonstrated at the meetings.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, AUGUST 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during August 1959 decreased by 8.0 percent in quantity and 16.3 percent in value as compared with July 1959. The decrease was due primarily to lower imports of groundfish fillets (down 6.5 million pounds), frozen other tuna (down 3.3 million pounds), frozen shrimp (down 2.8 million pounds), and lobsters (down 2.9 million pounds), and to a lesser degree, a decrease in the imports of canned tuna in brine and fresh and frozen salmon. The decrease was partly offset by a 2.4-million-pound increase in the imports of frozen albacore tuna and other fillets (up 0.4 million pounds).

United States Foreign Trade in Edible Fishery Products, August 1959 with Comparisons									
	Q	uantit	У		Value				
Item	Aug	ust	Year	Aug	just	Year			
	1959	1958	1958	1959	1958	1958			
	(Mill	ions c	f Lbs.)	(Mi	llions	of \$)			
Imports: Fish & shellfish: Fresh, frozen, & processed!	85.9	91.0	956.8	22.6	25.2	278.4			
Exports: Fish & shellfish: Processed only 1/ (excluding fresh & frozen)			41.2	 					
1/Includes pastes, sauc other specialties.	es, cl	am cl	nowder	and j	uice,	and			

Compared with August 1958, the imports in August this year were down by 5.6 percent in quantity and 10.3 percent in value due to lower imports of frozen albacore and other tuna (down 7.4 million pounds), fresh and frozen salmon (down 3.0 million pounds), and frozen shrimp (down 1.5 million pounds). Compensating, in part, for the decreases was an increase of about 1.4 million pounds in the imports of fillets other than groundfish and canned salmon (up 0.6 million pounds).

United States exports of processed fish and shellfish in August 1959 were lower by 26.9 percent in quantity, but higher by 14.3 percent in value as compared with July 1959. Compared with the same month in 1958, the exports this August were higher by 85.1 percent in quantity and 77.8 percent in value. The higher exports in August this year as compared with the same month in 1958 were due to better stocks of California sardines available for export to foreign markets.

* * * * *

GROUNDFISH FILLET IMPORTS, SEPTEMBER 1959:

During September 1959, imports of groundfish (including ocean perch), classified as fillets, into the United States amounted to 6.3 million pounds, according to data obtained from the U. S. Bureau of Customs and published by the Bureau of Commercial Fisheries. However, since September 15, 1959, fish fillet blocks are being classified under a different category and are not included with the fillets as previously. Thus imports including fish blocks would be much higher in September 1959, but exact data won't be available until later.

During the first nine months of 1959, total imports of groundfish and ocean perch classified as fillets (but not including fish fillet blocks since September 15) into the United States totaled 126.1 million pounds.

Note: See Chart 7 of this issue.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the $12\frac{1}{2}$ -percent rate of duty is 52,372,574 pounds. Any imports in excess of the quota will be dutiable at 25 percent advalorem.

Imports from January 1-October 31, 1959, amounted to 43,114,352 pounds, according to data compiled by the Bureau of Customs. January 1-October 31, 1958, a total of 42,349,036 pounds had been im-

ported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.



U. S. Production of Fish Sticks andPortions, July-September 1959

The United States production of fish sticks in the third quarter of 1959 was 13.0 million pounds and fish portions

Table 1 - U. S. Production of Fish Sticks by Months, July-September 19591 Month Cooked Raw 3,477 292 3,769 July . 3,560 295 August . 3,855 4,752 592 September . . 5,344 Total 3rd. quarter 1959 11,789 1,179 12,968 Total 3rd. quarter 1958 12,855 1,405 14,260 Total first 9 months 1959 3,758 44,981 41,223 Total first 9 months 1958 40,766 4,202 44,968 1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, July-September 1958 and 1959									
Area	Area 19591/ 19582/								
	No. of	1,000	No. of	1,000					
	Firms Lbs. Firms Lbs.								
Atlantic Coast States .	24	10,812	21	11, 329					
Interior and Gulf States	6	1,216	4	1,704					
Pacific Coast States	9	940	11	1,227					
Total	39	12,968	36	14,260					
1/Preliminary.									
2/Revised.									

fish-stick production. The remaining 1.2 million pounds, or 9 percent, consisted of raw fish sticks. A total of 8.2 million pounds of breaded fish portions (of which 7.1 million pounds were raw) and nearly 0.5 million pounds of unbreaded portions was processed during the third quarter of 1959.

The Atlantic Coast was the principal area in the production of both fish sticks and portions with 10.8 and 4.4 million pounds, respectively.

During the first nine months of 1959, a total of 45.0 million pounds of fish sticks was produced—an increase of less than 1 percent as compared with the corresponding period of 1958. Fish portions (26.1 million pounds) were up 72 percent over the nine-months period of 1958.

Table 3 - U. S. Production of Fish Sticks by Months, 1955-1959										
Month 19591/19582/1957 1956 1955										
_			1,000 Ll							
January	6,316	5,471	4,261							
February	6,394	5,925	5,246	5,323	5,794					
March	5,622	5,526	5,147	6,082	7,205					
April	4,708	4,855	4,492	3,771	5,953					
May	4,398	4,229	3,380	3,873	4,879					
June	4,575	4,702	3,522	3,580	5,392					
July	3,769	4,574	3,821	3, 153	4,340					
August	3,855	4,358	4,643	4, 166	4,520					
September .	5,344	5,328	4,861	4,085	4,535					
October	_	5,485	5, 162	5,063	5,261					
November .	-	5,091	4,579	4,585	4,946					
December .	-	5, 359	4,014	4,019	4,876					
Total .	-	60,903	53, 128	52,562	63,046					
1/Preliminary.			<u>2</u> /I	Revised.						

Table 4 - U. S. Production of Fish Portions by Months and Type, July-September 19591/								
Month	Cooked	Breaded Raw	Total	Unbreaded	Total			
		(1,000 Lbs	5.)				
July	216	1,903	2,119	127	2,246			
August	291	2,353	2,644	171	2,815			
September	593	2,808	3,401	182	3,583			
Total 3rd. quarter 1959	1,100	7,064	8,164	480	8,644			
Total 3rd. quarter 1958	754	4,085	4,839	403	5,242			
Total first 9 months 1959	3,731	20,530	24,261	1,851	26,112			
Total first 9 months 1958	2,472	11,330	13,802	1,389	15,191			
1/Preliminary.								

totaled 8.6 million pounds. This was a drop of 1.3 million pounds, or 9 percent, in fish sticks, but a gain of 3.4 million pounds, or 65 percent, in portions as compared with the same quarter of the previous year.

Cooked fish sticks (11.8 million pounds) made up 91 percent of the total

Table 5 - U. S. Production of Fish Portions by Areas, July-September, 1958 and 1959									
Area 1959 ¹ 1958									
Atlantic Coast States . Interior, Gulf, and	No. of Firms 23	1,000 Lbs. 4,398	No. of Firms 15	1,000 Lbs. 2,902					
Pacific Coast States.	12	4,246	7	2,340					
Total	35	8,644	22	5,242					
1/Preliminary.									

Table 6 - U. S. Production of Fish Portions by Months, 1958-1959								
Month		19591/	1958					
		(1,000	Lbs.)					
January		2,665	1,973					
February		2,996	1, 254					
March		3,203	1,471					
April		2,627	2,268					
May		2,706	1,478					
June		3,271	1,504					
July		2,246	2, 161					
August		2,815	1,516					
September		3,583	1,566					
October		1	2,560					
November			1,979					
December			2,060					
Total	•	-	21,790					
l/Preliminary.								



United States Fishery Landings, January-August 1959

Landings of fish and shellfish in the United States during the first eight months of 1959 were 11 percent higher than for the same period of 1958.

Menhaden landings, following the upward pattern of the preceding month, accounted for the greater production with an increase of 510 million pounds. Landings of Alaska herring also showed an increase which, with the season over, totaled 110 million pounds—a gain of more than 21 million pounds. Among the food fishes, shrimp landings for the first eight months of 1959 were up over 11 million pounds in the South Atlantic and Gulf States. In New England, the catch of whiting increased by 7 million pounds.

Alaska salmon landings declined considerably (down 99 million pounds) with the fishing season past its peak. Tuna landings dropped 37 million pounds below the same period of 1958--due largely to the tie-up of the tuna fleet. Landings of Pacific sardines since the opening of the season on August 1 totaled only 10 million pounds, due mainly to a price dispute in Southern California. Over 76 million pounds of Pacific sardines were taken by September 30, 1958. Ocean perch landings in New England and Maine herring were down 13 million pounds and 11 million pounds, respectively. The production of industrial fish

Table 1 - United State for Perio		Landings of 1959 and 1		Species
Species	Period	1959	1958	Total 1958
Anchovies, Calif.	8 mos.	2,000	(1,000 l bs.) 6,072	8,148
Cod:	o mos.			
Maine	7 mos.	2,100 12,700	2,191 11,829	2,735 16,183
Gloucester	8 "	2,200	2,198	3,189
Total cod		17,000	16,218	22,107
Haddock: Maine	7 mos.	2,100	2,666	3,997
Boston	8 "	52,400	64,616	81,509
Gloucester	8 "	10,200	7,986	9,798
Total haddock		64,700	75,268	95,304
Halibut 2/: Wash, and Oreg	0 5700	16,200	13,758	16,200
Alaska	8 mos.	20,400	18,159	19,814
m 1 b . 1/b		BC C00	21 017	26.014
Total halibut		36,600	31,917	36,014
Maine	7 mos.	60,400	71,607	170,977
over) Industrial Fish,	8 ''	110,000	88,801	88,801
Maine & Mass, 3/	8 mos.	72,900	89,300	108,869
Mackerel, Calif.: Jack	8 mos.	15,800	8,364	21,698
Pacific	8 "	12,800	12,984	24,624
Menhaden	8 mos.	1,528,240	1,018,421	1,544,700
Ocean perch:		40.400	44.540	71 0CO
Maine	7 mos.	43,400 1,900	44,549 1,632	71,068 2,6 2 5
Boston	8 ''	41,300	53,786	74,951
	L		00.007	140.044
Total ocean perch Salmon:		86,600	99,967	148,644
Wash. 4/	8 mos.	24,500	20,213	54,363
Oreg. 4/	6 ''	2,100	3,418	8,179
Alaska	8 "	134,500	233,176	241,255
Sardines, Pacific . Scallops, sea, New	9 mos.	10,500	76,100	207,429
Bedford (meats) .	8 mos.	12,300	10,679	15,253
Shrimp (heads-on):		110 400	100 100	105 000
South Atl. & Gulf.	8 mos.	118,400	107,100 5,911	195,808 6,730
Washington	8 "	2,000 1,900	1,268	
Alaska	8 "	9,500	4,856	
Squid, Calif	7 mos.	15,500	3,974	
Tuna, Calif to	Sept. 19	217,500	254,156	307,378
Whiting:				
Maine	7 mos.	18,300	20,551	
Boston	8 "	500 45,100	243 35,851	596 58,927
Total vehicing		62 000	56,645	83,100
Total whiting Total of all above	items	63,900 2,619,640		3,403,630
Others (not listed		427,360	439.262	1,312,370
		3,047,000		4,716,000
1/2-11-1		0/2,01,.3:	na manha d	on.
1/Preliminary. 2/Dressed weight.		3/Excludi 4/Landed	ng menhad weight.	al .

in that area decreased by 16 million pounds, compared with the first eight months of 1958.

Table 2 - United States Fishery Landings by States for Periods Shown, 1959 and 1958 1/

for Perio	ods Show	n, 1959 and	1998 1/	
Area	Period	1959	1958	Total 1958
		(1,000 lbs.)	
Maine	7 mos.	146,100		
Massachusetts 2/:		,	,	
Boston	8 mos.	78,500	91,839	123,764
Gloucester	8 "	162,500	153,564	230,218
New Bedford	8 "	78,100	80,541	111,669
Provincetown	8 ''	17,100	14,100	25,754
Total Mass		336,200	340,044	491,405
Rhode Island 3/	7 mos.	73,200	61,089	103,452
New York 3/	7 "	23,000	24,800	42.063
New Jersey 3/	8 "	37,800	32,777	50,933
North Carolina 3/	8 **	41,700	40,849	54,866
South Carolina 3/	8 "	8,800	9,409	15,359
Georgia	8 "	11,900	11,612	20,066
Florida 3/	8 "	85,300	95,073	158,724
Alabama	7 "	7,700	5,395	10,343
Mississippi 3/	7 "	10,600	8,002	82,476
Louisiana 3/	5 "	24,600	28,800	75,237
Texas 3/	7 "	26,400	27,324	80,478
Ohio (MarJune)	6 39	12,200	12,029	19,145
Oregon 2/	6 "	19,700	26,645	59,467
Washington 2/	8 "	98,000	92,506	164,987
California:		20,000	02,000	101,00
Certain species 4/	8 mos.	274,100	361,650	581,199
Other	5 "	35,600	35,931	82, 709
Total Calif		309,700	397,581	663,908
Rhode Island, Middle		555,.00		,
Atlantic, Chesapeake	1			
South Atlantic, and	, 	1		
Gulf States (menhad	len	1		
only)	8 mos.	1,499,700	1,014,628	1,540,867
Alaska:		,,	_,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Halibut 5/	8 mos.	20,400	18,15 9	19,814
Herring (season				
over)	8 **	110,000		88,801
Salmon	8 "	134,500		241,255
Shrimp	8 "	9,500	4,856	7,862
Total of all above it		3,047,000		4,308,463
Others (not listed).		6/	6/	407,537
Grand total		6/	6/	4,716,000

1/Preliminary.

2/Landed weight. 3/Excluding menhaden.

4/Includes catch of anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on tuna are for the season to September 19; data on squid are for first seven months.

5/Dressed weight. 6/Data not available.

Note: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.

Wholesale Prices, October 1959

The October 1959 wholesale price index (121.1 percent of the 1947-49 average) for edible fishery products (fresh, frozen, and canned) was down slightly (0.4 percent) from September 1959 because of lower prices for drawn large haddock and fresh and frozen shrimp. But compared to October a year ago, a more substantial decline of 6.6 percent occurred due to lower prices for 10 out of the 17 items making up the edible fishery products index. This year supplies have been more plentiful and normal while last year they were light and below normal.

Due to a temporary improvement in the landings of large drawn haddock at Boston during mid-October 1959, good supplies of frozen halibut, and a slight improvement in Great Lakes yellow pike supplies, the October 1959 drawn, dressed, and whole finfish subgroup price index dropped 3.8 percent from September. But fresh-water whitefish prices were higher. Compared to October a year ago, this October there were price declines of 14.2 percent for large haddock, 7.3 percent for frozen dressed halibut, and 3.0 percent for fresh and frozen king salmon which resulted in a drop of 4.0 percent in the subgroup index. These declines were only partially offset by higher wholesale prices for the fresh-water items.

Fresh processed fish and shellfish prices in mid-October 1959 were up by 3,7 percent from the preceding month, Higher prices for fresh small haddock fillets (up 23,2 percent) and fresh shucked oysters (up 10,2 percent) offset a drop of 6,1 percent in prices for fresh headless shrimp, From October last year to October 1959 the fresh processed fish and shellfish subgroup index dropped 8,5 percent. Lower prices for fresh small haddock fillets (down 15,0 percent) and fresh headless shrimp (down by 24,7 percent) more than offset an increase of 12,5 percent in fresh oyster prices. East Coast oyster supplies were short during the 1958/59 season and this shortage is even more pronounced as the 1959/60 season entered into full swing this October.

Changes in the wholesale price index for processed frozen fish and shellfish from September to October this year were slight (down only 0.7 percent). An increase of about 1 cent a pound in frozen flounder fillet prices failed to overcome a further drop of 2.8 percent in frozen headless shrimp prices at Chicago. Prices for frozen haddock fillets and ocean perch fillets remained unchanged. The drop in the price index for this subgroup from October 1958 to October 1959 was sharper (20.1 percent). Declines in frozen fillet prices ranged from 19.7 percent for haddock fillets, 9.9 percent for ocean perch fillets, and 8.4 percent for flounder fillets. The sharpest drop occurred in the frozen headless shrimp price, which was down 25.8 percent. More imports, generally larger domestic landings, and substantial inventories were responsible for the sharp drop in prices from October 1958 to this October.

Canned fish prices in October 1959 were unchanged from the preceding month. The packing season for Maine sardines and West Coast salmon was about over by the end of the month with a sharply lower pack of canned salmon and about a 10-percent smaller pack for Maine sardines. As of October 29 the estimated pack of California sardines was only 533,920 cases (48 1-lb, cans) a drop of 71.4 percent from the 1,883,720 cases packed to that date in 1958. Tuna canning began to pick up in October following several months of tie-ups because of disputes over ex-vessel prices at California producing and canning centers. The 1959 pack of canned tuna will be high, but not up to the record set in 1958. The October 1959 canned fish price index was up about 1.6 percent from October a year ago because available supplies were lighter. Canned salmon (up 12.6 percent) and canned Maine sardines (up 6.4 percent) more than compensated for price drops of 9.6 percent for California tuna and 12.3 percent for California sardines.



Table 1 - Wholesale Average Prices and Indexe	s for Edible F	ish a	nd Sh el	lfish, Octo	b er 195	9 With Co	mparisc	ons
Group, Subgroup, and Item Specification	Point of Pricing	1			lexes 49=100)			
			Oct. 1959	Sept. 1959	Oct. 1959	Sept. 1959	Aug. 1959	Oct. 1958
LL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121,1	2/121.6	119.8	129.6
Fresh & Frozen Fishery Products: Drawn, Dressed, or Whole Finfish: Haddock, Ige., offshore, drawn, fresh Halibut, West., 20/80 lbs., drsd., fresh or froz. Salmon, king, Ige. & med., drsd., fresh or froz. Whitefish,L. Superior, drawn, fresh Whitefish,L. Erie pound or gill net, rnd., fresh Yellow pike, L. Michigan & Huron, rnd., fresh Yellow pike, L. Michigan & Shellfish): Fillets, haddock, sml., skins on, 20-lb. tins Shrimp, Ige. (26-30 count), headless, fresh Oysters, shucked, standards		lb. lb. lb. lb. lb. lb. lb. gal.	.13 .32 .79 .75 1.00 .69	.33 .80 .73 .73 .73	153.8 127.9 98.5 177.2 185.9 202.3 161.8 128.9 144.6 98.7	153.1 101.1 179.7 179.7 146.7 170.0 2/124.3 117.4	132,8 152,2 109,1 107,8 179,7 158,6 161,8 193,5 121,5 125,9 101,1 148,5	149.2 160.2 149.0 106.2 182.6 161.1 182.0 138.4 140.8 170.1 131.1 148.5
Processed, Frozen (Fish & Shellfish): Fillets: Flounder, skinless, 1-lb. pkg. Haddock, sml, skins on, 1-lb. pkg. Ocean perch, skins on, 1-lb. pkg. Shrimp, lge. (26-30 count), 5-lb. pkg. Canned Fishery Products: Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, lk. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. Sardines, Maine, keyless oil, No. 1/4 drawn	Boston Boston Boston Chicago Seattle Los Angeles Los Angeles				106,4 99,5 102,0 108,8 95,3 103,4 127,8 77,9	96.8 102.0 108.8 98.0 103.4 127.8	112.3 98.2 102.0 108.8 106.5 102.0 123.9 77.9	133. 108.6 127. 120.8 128.5 101.8 86.2 100.4

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.
2/Revised.



METHOD FOR DETERMINING FRESHNESS OF FISH

A method for determining the freshness of sea fish based on the determination of volatile, permanganate-reducing substances in fish, is stated to be independent of the variety of fish and easily done on whole fish, and fresh or frozen fillets. Air is passed through 5 ml. of test fish pulp, through a safety trap, and into an absorption flask containing either 10 or 20 ml. of 0.02N KMnO4 in 1N NaOH. A 2 ml. aliquot, to which has been added 1 ml. 6N H2SO4 and 0.6 ml. 20 percent Kl in 0.1N Na2CO3 is titrated with 0.00025N Na2S2O3 to a starch indicator end point. The following microequivalents were found: 0 in freshly killed fish, 0 to 10 in fresh fish, 10 to 20 for those with first observable changes in quality, greater than 20 for those starting decomposition, and greater than 30 for those showing putrefaction (Die Fischwaren und Feinkostindustrie, April 1958).



International

FOOD AND AGRICULTURE ORGANIZATION

FISHERY STATISTICS TRAINING CENTER HELD IN DENMARK:

Twenty government officials from 14 countries and territories attended the International Training Center in Fishery Statistics, organized by the Food and Agriculture Organization (FAO), Rome, Italy, and held in Copenhagen, Denmark, at the invitation of the Danish Govern-



ment. The following countries attended the Center: Ethiopia, Ghana, Greece, Iran, Lebanon, Liberia, Morocco, Nigeria, Pakistan, Turkey, British overseas territories (Malta, N. and S.

Rhodesia, Uganda), and Yugoslavia.

The Training Center was particularly designed for those who are immediately responsible for the collection and collation of primary fishery statistics. Holding the Center in Copenhagen was especially advantageous because Denmark has a highly developed fishing industry and the Government Statistical Services are very well organized and efficient, thus providing excellent facilities for study.

During the five-week course, the participants attended lectures and demonstrations on organization, methods, practical application, and evaluation of fishery statistics.

Seminars were an important feature of the Center at which individual participants introduced and discussed reports on the present organization of fishery

statistics in their own country, with special reference to improvements which could be effected in the light of information gathered at the Center.

After two weeks in Copenhagen, the participants moved to Hutshels, a fishing port in North Jutland, where they took part in the collection of statistical data and also got an insight into fishing methods, landings, gear, etc.

Denmark is particularly well suited for field work of this nature because the fishing industry is based on a large number of small, owner-operated craft, using a wide variety of fishing gear, based on widely scattered fishing ports of all sizes. The rapidly-developing fisheries in the participating countries are facing problems of statistical design and management similar to those faced, and successfully solved, in Denmark for the last 40 years.

* * * * *

FISHERIES SURVEYS TRAINING CENTER HELD IN TANGANYIKA:

A Training Center on Fisheries Surveys for the countries in the African region, organized by the Food and Agriculture Organization (FAO), was held at Tanga, Tanganyika, from November 9-December 18, 1959.

The Center was directed by the Fisheries Officer of Tanganyika and a professor from the University of Washington in Seattle, U. S. A., acted as Associate Director. A number of FAO officers participated in both the theoretical and practical work of the Center. These included a fisheries biologist from the headquarters staff, a marketing expert on assignment in Ghana, an expert on assignment as fisheries biologist in Uganda, and a member

of the Japanese Ministry of Agriculture and Forestry who lectured at the Indian Fisheries Statistics Training Center held earlier this year in Bombay.

The Training Center was concerned with the objectives, methods, and uses of surveys in all phases of fish production, processing, and distribution.

Apart from the lectures, the participants at the Center made field trips which were used to illustrate the instruction given in the classroom. In addition, the special problems of the fisheries in the African region were discussed in seminars.

Participants at the Training Center came from all parts of Africa and included not only students from independent African countries, but also from territories and dependencies.

* * * * *

SARDINE MEETING CALLS FOR INTERNATIONAL COOPERATION IN RESEARCH:

Nine general recommendations to promote rapid international exchange of information and data obtained from research and other work on sardine problems were made in the final report of the World Scientific Meeting on the Biology of Sardines and Related Species, which was held in Rome, Italy, from September 14-21, 1959.

The meeting, convened by the Food and Agriculture Organization (FAO) at its Rome headquarters, was attended by more than 50 experts from 26 countries. Some 60 scientific papers were presented.

The objectives of the meeting were to appraise the status of knowledge on the biology of sardines, assess present methods of research and indicate the lines along which national and international action might be developed to improve research programs.

The nine general recommendations of the meeting call for FAO leadership in promoting international cooperation in dealing with sardine problems. Specifically the scientists asked FAO to publish an annotated bibliography on sardine research, a directory of sardine research institutions, and strengthen the work of producing synopses on species of sardines and other fishes of economic value.

The meeting also called on FAO to convene "follow-up meetings on the biology of sardines" and on other species "for which major fisheries exist," promote standardization of routine methods used in research programs, encourage exchange visits between scientists and focus attention on the need to improve specialized research on sardines.

A section of the report dealing with "Perspectives in Sardine Research" focuses attention on a number of special problems and indicates the lines of approach that should be adopted. These include more extensive and intensive use of modern techniques and a more comprehensive approach to the various aspects of the sardine problems.

The commercial importance of sardines and the continuing fluctuations in sardine stocks, resulting in severe economic losses for fishermen, attracted world attention to the meeting. There were participants from most of the countries concerned with sardine fisheries and observers from non-government and commercial organizations. At the conclusion of the meeting the participants took the unusual action of passing a resolution to thank FAO for convening and running the meeting which had been, the resolution stated, "a universal success."

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

SIXTH ANNUAL MEETING HELD IN SEATTLE:

Fisheries administrators and experts from Canada, Japan, and the United States met in Seattle, Wash., in October for intensive discussion of fisheries problems in the North Pacific Ocean. The sixth annual meeting of the International North Pacific Fisheries Commission was opened by the Chairman of the Commission on October 19.

The Commission, established by treaty between the member Governments, conducts research and makes recommendations on fishery conservation problems on stocks of fish of joint interest throughout the high-seas areas of the North Pacific Ocean.

At the meeting the Commission received reports from many scientists on the latest results of a large-scale research program which is studying the distribution, abundance, and movements of salmon from the Asian and North American continents on the high seas. In addition, the Commission studied the conditions of utilization and conservation of North American salmon, herring. and halibut stocks to determine whether or not Japan, and in some cases, Canada, should continue to refrain from fishing such stocks. Abstention from fishing is effective in the eastern portion of the North Pacific and in the eastern Bering Sea. In the case of salmon on the high seas, Japan abstains from fishing east of a line along the meridian of west longitude, which passes near Atka Island in the Aleutians, about 2,000 miles west of Seattle. This line, which is temporary or provisional in nature, is the subject of much research designed to determine whether another line or lines would more equitably divide the Asian and North American salmon stocks.

A preliminary scientific session, begun on October 12, was held at the Commission's headquarters on the Campus of the University of British Columbia, Vancouver. This session brought together 15 scientists from the three countries for intensive study of the stocks of fish under abstention.

Each member country was represented on the Commission by four members. In addition to Edward W. Allen, Seattle attorney, who is Chairman of the Commission, the United States Commissioners included Milton E. Brooding of the California Packing Corporation, San Francisco; John H. Clawson, Anchorage, Alaska; and Arnie J. Suomela, Commissioner of Fisheries, U. S. Fish and Wildlife Service, Washington, D. C.

The Japanese Commissioners (all from Tokyo) were: Iwao Fujita, Vice-Chairman of the Japan Fisheries Association; Haruki Mori, Director of the American Affairs Bureau, Foreign Ministry; Kenjiro Nishimura, Director of the Fisheries Agency of Japan; and Koichiro Kobayashi, Vice-President of the Nichiro Fishing Company.

The Canadian Commissioners were George R. Clark, Deputy Minister of Fisheries, Ottawa; John M. Buchanan, President of British Columbia Packers Limited, Vancouver; James C. Cameron, Pender Harbour; and Roger T. Hager, President of the Canadian Fishing Company, Vancouver.

The Commissioners were accompanied by a number of experts and advisors, bringing the total number of participants to approximately 100. General arrangements for the meeting were made by the Commission's Secretariat.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

DART TAG USED BY COMMISSION FOR FIRST TIME TO TAG HALIBUT:

This year for the first time the International Pacific Halibut Commission used the dart tag to tag halibut in the North Pacific. Tagging is used extensively by the Commission to determine when and where halibut can be fished to obtain full utilization of the North Pacific halibut stocks. The accuracy of results and consequently the usefulness of the tagging experiments depends upon the degree to which recovered tags are returned to the Commission.



Fig. 1 - A dart tag in position on a North Pacific halibut.

No vessels were chartered during the summer and fall of 1958 for the express purpose of tagging halibut. However, the University of Washington

research vessel Commando was chartered for a period of 57 days during May and June 1958, and 222 halibut were tagged in the vicinity of Marmot Bay between Afognak and Kodiak Islands. A number of the tagged halibut were held in floating live boxes temporarily to observe the effects of tagging upon the fish. These observations indicated that the tagging process did not result in any significant mortalities immediately after tagging.

Strap tags are sometimes overlooked on the dark side of the fish because hallbut are usually handled white side up. This loss reduces the practical value of the tagging experiments. The number of tags lost in this manner can be estimated by marking some of the fish with a second tag. For this reason some of the fish tagged in the Bering Sea in the spring of 1959 have a new type of tag (the dart tag1/) attached in the vicinity of the pectoral fin on the white side of the fish in addition to the strap tag. This tag consists of an orange vinyl plastic tube, approximately one-eighth inch in diameter and 12 inches in length and is held in place by means of a solid nylon plastic barb imbedded in the meat of the fish. The letters IPHC and a number are stamped on each tag.

To obtain a reliable measure of the efficiency of this tag, it was necessary to tag three groups of fish simultaneously. One group with only the new tag or "dart tag," a second group with only a strap tag (placed on the gill cover on the dark side), and a third group with both tags. Therefore, when a tagged fish is recaptured, it should be examined for both tags. If two tags are found, they should be



Fig. 2 - A fully-exposed dart tag lying beside one that has already been applied, and also a tag inserted into the hollow needle by which the tags are inserted in the halibut. The barbs on the tag do not show up well against the white background.

turned in together as this is the Commission's only means of correctly evaluating tag loss.

The fish migrating furthest in 1958 was caught by the M/V Capella I while fishing off Cape Scott. This fish was released in the Bering Sea off Akun Head in 1956 and had migrated approximately 1,550 miles in two years.

Two other fish tagged in the Bering Sea on the "Polaris Spot" also made long migrations of approximately 1,400 miles each. Both were recaptured in Dixon Entrance, one by the M/V $\underline{\text{Frisco}}$ and the other by the M/V Dovre B.

A new Commission record for length of time out following tagging was set when the M/V Oona R. recovered a fish released on December 21, $\overline{1939}$. This halibut was six years old when tagged and weighed approximately ten pounds. At recovery, $18\frac{1}{2}$ years later, it had grown to approximately 65 pounds. During its period of freedom this halibut made a net migration of only about 60 miles, having been tagged off Cape St. James and being recovered in the vicinity of Cape Mark.

The greatest number of tags turned in during 1958 were received from the M/V Soupfin with 34. Closely behind with 33 recoveries was the M/V Kaare.

1/Although new for halibut tagging, the "dart tag" is being used for tagging many other fish.

UNITED STATES-JAPANESE TUNA CONFERENCE

PLENARY SESSIONS AND COMMITTEE MEETINGS HELD OCTOBER 1-11:

Japan and the United States held a meeting, which opened in Tokyo on September 30, for the exchange of views and information between the two countries on the tuna industry and its problems.

The Japanese Government announced September 28 that government officials and private fishing representatives of the two countries would meet for 13 days, with the meeting expected to end October 12, according to Japan Times of September 30.

The Japanese were represented by 11 Government officials and 13 private representatives, including a representative of the Foreign Office, the Director of the Fishery Agency, and the Vice-Chairman of the Japan Fishery Association.

The United States group comprised 10 Government and some 10 private representatives headed by the Deputy Assistant Secretary of State for Economic Affairs.

Discussions at the talks centered on:

 Research on biological, ecological, and oceanographical aspects of tuna and

studies concerning distribution of resources.

- 2. The current tuna catch situation and catch methods.
- 3. Utilization of tuna and processing techniques.
- 4. Past trends in production, consumption, and price of tuna and its products in Japan and the United States.

October 1-5 was devoted to discussion in plenary sessions of all agenda items giving each country two full days. The chairmanship alternated between the two delegations. After October 5, the working sessions were divided into two comittees—one committee handled agenda items 1 and 2 and the second committee items 3 and 4. Simultaneous committee meetings were held through October 9. October 9-11 the meeting's final report was prepared.

At the final session held on October 12, 1959, the United States-Japanese Tuna Conference issued the following press release:

At the final Plenary Session of the Tuna Conference, the delegations of Japan and the United States reviewed and approved the work of the two Committees established at the opening session of the conference. These Committees reported the results of their consideration of the four items on the agenda of the conference: (1) Biological, ecological, and oceanographic study of tuna and the distribution of tuna resources; (2) Present conditions of harvesting and fishing methods of tuna; (3) Present conditions of utilization of tuna and technology of its processing; and (4) Past movements of the tuna market with respect to production, consumption, and price in each domestic tuna market.

In Committee One research on biology, ecology, and oceanography, and harvesting conditions with respect to tuna were reviewed. Information concerning re-

search activity was freely exchanged and indicated that the broad objectives of such research were similar in the two countries.

With respect to research, the fields of inquiry discussed included methods and scope of the documentation and examination of fishing activity and of basic biological and oceanographic research.

It was noted that statistical information plus scientific information on the fisheries is essential to the measurement of the condition of the stocks, and both countries recognized the importance of this matter.

The Committee's deliberations indicated that extensive studies are being made of the ocean circulation of the Pacific and the relationship of the environment to the variations in distribution and migrations of tuna. These studies and research on life history were reviewed. No information presented indicated that there is overfishing of any tuna stocks.

Information on catch, catch trends and fleet composition, together with the factors affecting these, were freely considered. The Committee noted that the Japanese catches, fleets, and areas of operation have expanded in recent years. The number of vessels was stabilized in Japan in 1955 through a governmental system of licensing although tonnage and capacity continued to increase. It is now being gradually halted. The catches and fleets of the United States have declined, and the fishing areas of the United States have remained relatively the same. The increase in long-line fishing in Japan and the very recent tendency to place more emphasis on purse-seine fishing in the United States were noted. Government regulations and activities affecting these fields were compared.

It was learned that Japan has a comprehensive communications system reporting on current fishing conditions in which the Government participates, whereas the United States has not.

In Committee Two pertinent material concerning problems of utilization

common to the tuna industries of both countries was presented. There was a very informative discussion of such problems as green tuna, the biochemistry of tuna, quality standards, grading of tuna, the status of cholesterol research, the use of antibiotics in tuna preservation, and the use of tuna in pet foods. Information was presented pertaining to these subjects and views were freely exchanged. There were suggestions made by both sides concerning further exchange of information on these subjects.

In view of the importance of the tuna resource to each country, the world catch and its possible effect on future supplies of tuna were discussed. The total catch of tuna by all countries is steadily increasing, as is the world consumption.

Large segments of the tuna fishing industry of the United States have been beset with increasingly serious problems during recent years. Periods of distress during which the United States tuna fishing industry faced its most difficult problems were noted and the possible causes of these difficulties were discussed by the delegates of both countries.

The two delegations agreed that the conference had been very helpful to the tuna industries of both countries by providing an opportunity for the exchange of information and views on these subjects.

The two delegations noted that coordination of activities on specific research projects would contribute to the success of the research work being carried on by their respective governments.

The two delegations agreed to recommend to their respective governments (1) that supplementary data on scientific and technical matters of interest to both countries should be exchanged on a continuing basis through the usual channels; and (2) that, in cases where meetings for scientific research on tuna are held in either country, the scientists of other nations should be invited to take part in so far as possible.

UNITED STATES AND RUSSIA EXCHANGE SCIENTIFIC FISHERY KNOWLEDGE

Five American fishery experts returned home in late September following an extensive inspection of Russian salmon fisheries, and five Russian fish experts arrived in the United States to observe American salmon activities. The trips were arranged for an exchange of scientific and practical fishery information.



Fig. 1 - Assistant Secretary of the Interior for Fish and Wildlife Service, Ross L. Leffler, welcomes Russian fisheries experts at the beginning of their visit to the United States.

The Americans departed from Washington on August 20, 1959, with the Kamchatka Peninsula in Siberia as their destination. They arrived there, via Moscow, several days later and returned home, also via Moscow, on September 22. They spent one day in the Russian capital on their way to their Siberian destination, and four days on their way home.

The Russians arrived in Washington on September 24 and departed by plane for the Pacific Northwest and Alaska on September 26, returning to Washington about October 21. Their itinerary included inspection of salmon hatchery operations and the work of fish nutrition and fish disease laboratories in the Northwest. They saw the operations of can companies, canneries, fish



Fig. 2 - Russian fisheries experts, accompanied by the head of the Alaskan Department of Fish and Game and the U. S. Bureau of Fisheries Regional Director for Alaska, visit Governor Egan of Alaska in his office

freezing and cold-storage facilities. They also inspected several Government laboratories.

The United States mission to the Russian salmon areas had a double purpose-to give United States specialists an opportunity to learn of Russian fishery operations first hand, and to secure fish and fish blood samples of known Russian origin for a long-range international salmon study which has been in progress for about three years.

Members of the United States group reported success in both aims, stressing that their hosts were especially cooperative.

The North Pacific salmon study is a three-nation project-Japan, Canada, and the United States. One purpose of this study was to secure data upon which Nations of Asia and North America may base salmon management plans. A specific problem is to determine the place and the extent of intermingling of the American and Asian races of salmon during the time the salmon are at sea. This in turn necessitates the development of a system of differentiating American from Asian fish. Research has indicated that probably the most reliable way to differentiate between the two races is by blood type.

At the U. S. Bureau of Commercial Fisheries Biological laboratory at Seattle, Wash., considerable work has been with salmon and blood samples from Japan, Canada, and the United States salmon areas. No salmon unquestionably of Russian origin were available for study until this exchange visit when the Russians—rathough their salmon fishing season in most areas was closed—let the United States visitors "catch their own" out of streams on the Kamchatka Peninsula.

Places visited by the United States mission included:

Khabarovsk, the big industrial center in Siberia some 225 miles from the Sea of Japan;

Okhotsk, fishery center, on the northern rim of the Sea of Okhotsk:

The October Fishery Combine's canning, salting, and freezing operations at the mouth of the Bystraya River in the southern portion of Kamchatka;

Canneries, salteries, and freezing plants at Ozernaya, also on the southwest coast of that peninsula;

The biological station on the Kurilian Lakes, several miles inland from the coast, and one of the great red salmon producing areas of the U.S.S.R.;

Fishery facilities at Nevelsk on the southern portion of Sakhalin Island, north of Japan;

And finally the free port of Nakhodka, near Vladivostok, where cold-storage and other facilities for the transshipping of ocean-borne goods to the Trans-Siberian Railway were observed.

At these places important phases of the salmon fishing industry were inspected and discussed—hatchery work, biological research, technological problems, gear research, and fish processing operations. Besides the "on the spot" discussions, there were meetings at what might be called area or regional levels plus four days in Moscow with the fishery research unit of the scientific committees which are in charge of research conducted in the Soviet Union.

Transportation across Siberia was by jet--10 hours on the return trip. Transportation across the Sea of Okhotsk to Kamchatka, then to Sakhalin Island, and on to the mainland was by a Russian refrigerated carrier vessel which was described as efficient and with comfortable quarters. There were train transportation and truck travel for short distances. On the trip to the Kurilian Lakes part of the journey was by horseback.

The United States group that made the trip to Russia included: Charles Butler, Saltonstall-Kennedy Coordinator, U. S. Bureau of Commercial Fisheries, who headed the delegation; Clinton Atkinson, Laboratory Director, Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash.; Clarence F. Pautzke, Assistant Director, Washington State Department of Fisheries; Winston C. Arnold, General Manager, Alaska Salmon Industry, Inc.; William R. Barlow, Interpreter, Office of the Secretary of the Interior.

The Russians who are in this country are: Andre Sergeevich Guidukov of Moscow, Director, Section on Fish Industry, State Planning Commission, R.S.F.S.R.; Aleksander Ivanovich Isaev, Moscow, Deputy Chief of Construction and Hatchery Operations; Vasali Nikiforovich Kalenov, Deputy Director of the Kamchatka Economic Council; Aleksander Nikovaevich Salinikov, trawler captain engaged in salmon operations; Igor Ivanovich Kurenkov, Deputy Director of the Kamchatka Fishery Research Institute.



Australia

ALL-WELDED ALUMINUM ALLOY SPINY LOBSTER PROCESSING VESSEL:

A recent addition to the Western Australian fishing fleet is the 62-foot aluminium alloy spiny lobster processing vessel Lady of Fatima.

The spiny lobster fishery in Western Australia has reached a stage where it is necessary for the larger boats to travel long distances to get good catches, and therefore to be capable of stowing large amounts of fuel. Also, it is desirable that the boats be able to process a relatively large amount of fish in order to avoid the loss of time in trips to Fremantle to unload, possibly 240 miles both ways. This particularly applies when the weather is good and good catches are being made; then a boat needs a big freezer to store the catch.

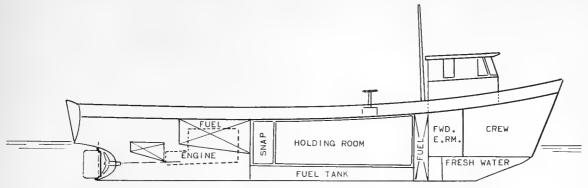
With these problems in mind, it was decided to build a new processing boat of aluminium alloy.

First the room available in a metal hull is greater than in a similar wooden hull, and by using a double bottom for fuel and fresh-water stowage, and built-in wing tanks for additional fuel, further space is saved and structural weight is reduced.

Second, by using aluminium alloy instead of steel, about half the structural weight is saved, and this is very impor-

Australia (Contd.):

tant when the speed required is high and a big payload is necessary. In this case 9 tons weight was saved by the use of aluminium. lings of the hull are rather generous, but no real difficulty was experienced in cold working the alloy. Also, hull distortion due to welding stresses was a lot less than expected.



General arrangement of Australian all-welded aluminium alloy spiny lobster processing vessel.

Third, the maintenance of an aluminium hull should be much less than for an equivalent wooden or steel boat, particularly a steel boat with its rust problem.

The boat's dimensions are: length over-all, 62 feet; beam, 17 feet; mean draught, 4 feet 9 inches.

A speed of 10.5 knots was required, and to achieve this an 8-cylinder turbocharged Diesel, delivering 230 bhp. at 1,350 r.p.m., was selected. On trials, a speed of 10.75 knots was recorded, and over 10 knots is maintained in service.

Fuel capacity is 2,600 Imperial gallons. On average working conditions, consumption is about 6 to 8 gallons an hour, which gives the vessel a range of around 3,000 miles.

The freezer is of large capacity for the size of the vessel, being 21 feet long by the full beam and depth of the boat. The plant is capable of quick freezing 60 x 25-pound cases of spiny lobster in six hours, and the refrigerated hold has a capacity of 1,500 cases of tails or 33,000 pounds of finfish.

The craft is of all-welded construction, and all welding was done manually. The frames are extruded alloy angles and were bent cold to shape. The scant-

All fuel tanks, water tank, etc., are alloy, built as part of the hull, and the deckhouse, which contains the wheelhouse, galley, and mess, and a berth for the wheel relief, is all welded alloy. There are four berths below decks. The forward peak tank holds 400 gallons of fresh water and an additional 100 gallons can be carried in one of the after ballast tanks

The anchor winch and pot-hauling winch are hydraulically-operated, with the hydraulic pump driven by the compressor engine.

Her sea behavior is much less lively than one would expect in a light buoyant hull. She maintains a very high speed in rough water. The fuel consumption is very good considered against the high operating speed. (Australian Fisheries Newsletter of June 1959.)

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MOST RESTRICTIONS ON IMPORTS FROM DOLLAR AREA REMOVED:

The Government of Australia has informed the United States Government that effective August 1, 1959, import quotas were enlarged and most discriminatory restrictions on imports from dollar sources were eliminated. This step should be of particular benefit to the United States, Canada, and other countries in the dollar area. In effect,

Australia (Contd.):

this measure opens the Australian market to dollar goods, on a nondiscriminatory basis for virtually all products except motor vehicles and timber.

Prior to the adoption of these measures, many items that could be imported into Australia from nondollar sources could not be purchased from the dollar area. The move greatly improves the opportunity of United States firms to compete on equal terms with firms from other countries for sales in the Australian market. It permits the import of many United States consumer goods which have not been available in Australia for many years.

This substantial liberalization of trade was facilitated by recent measures establishing currency convertibility and reflects the improved state of the Australian economy. The Government of Australia has announced that it intends to proceed with orderly removal of the remaining discriminatory restrictions.

* * * * *

SPINY LOBSTER EXPLORATORY FISHING:

During the first two weeks of a spiny lobster exploratory fishing survey of southern waters in Western Australia, only eight spiny lobsters were taken. One was a female which would have spawned in 4-6 weeks. The lobsters were obtained in two areas about 20 miles apart. They varied in weight from 3 lbs. 4 oz. to 6 lbs. 9 oz. each. The survey is being conducted with the chartered vessel Bluefin, based in Albany.

The survey commenced on June 8, 1959. In the third and fourth weeks (to July 4), the Bluefin set pots in the neighborhood of Breaker Island, Peak Head, West Cape Howe, Knapp Head, Ratcliffe Bay, Wilson's Head, Edward's Point, and Stanley Island. No lobsters were taken.

The Bluefin has been working 90 pots. They are set about 100 yards apart, so that with a line of 50 pots a fairly large area of reef can be tested. It takes about two minutes for a pot to be set and

about three minutes for a pot in 35 fathoms to be pulled. Salmon and shark heads, and cattle hocks are used as bait.

While traveling to the pots, two troll lines are usually put out. Bluefin tuna, mostly 2-3 pounds each, have been caught on the lines. Australian Fisheries Newsletter, August 1959.

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SHRIMP EXPLORATORY FISHING:

Last report received from the chartered vessel Challenge exploring for shrimp was to the end of June 1959. Some bad weather was experienced about the middle of June.

Trawling was carried out in the following areas: Port Hacking-Botany Bay, where there was a show of king prawns in 100 fathoms but no shrimp were taken in deeper water--Narrabeen, Broken Bay, Tuggerah, Terrigal.

Shrimp were taken in small quantity in 50-70 fathoms. Five deep-sea red shrimp were taken in about 140 fathoms. During the last week of June, in the Broken Bay area, red shrimp were taken in 85-150 fathoms. What was believed to be a new species of red shrimp was taken at 142 fathoms. Australian Fisheries Newsletter, August 1959.



Belgium

FISHING INDUSTRY FACES A CRISIS:

The crisis in the Belgium fishing industry, which has been developing for several years, recently received another severe blow when two large modern deepsea trawlers were transferred to Great Britain. The loss of these two vessels precipitated talk in Belgium fishing circles of a blockade of the Port of Ostend. If the blockade is carried out, it would dramatize the fishing industry's plight and be its most aggressive step for obtaining Government assistance and the imposition of import restrictions.

According to reports in Belgium fisheries periodicals, the industry is faced

Belgium (Contd.):

with bankruptcy. A recent investigation of the financial condition of fisheries firms revealed that the majority of the firms could not avoid bankruptcy if there were drastic demands for payment by their suppliers.

The transfer of the two large trawlers to Britain, where the vessels will fish with English crews and land fish for the British market, means the loss of good producing units and further unemployment in the West Flanders Province. The same owners of the transferred vessels, which recently obtained special conditions to build two supertrawlers, have abandoned the project because of the distressed condition of the fishing industry.

Spokesmen for the fishing industry believe that it is time to save the industry, not with conferences and talks, but with facts and a well-planned fisheries policy. (United States Consulate in Antwerp, September 16, 1959.)

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SHRIMP FISHING INDUSTRY CONCERNED OVER PRICES:

According to a spokesman for the Belgium fishing industry there is a deep concern in the Belgium shrimp fishery over near-term prospects, because of the prospect of large fall catches. It was expected that increased landings would have a drastic effect on prices, unless something was done by the Government to protect this fishery, which has been affected by a serious crisis since 1956.

The spokesman suggested different solutions, among which was the establishment of a Government purchase program for shrimp, a minimum price set-up, and the application of a tax on the import licenses for shrimp from West Germany and The Netherlands, which compete with the Belgium shrimp fishermen.

He felt that appropriate measures taken by the Government could restore some of the vitality which characterized the Belgium shrimp fishery during its boom period 1948-1955, whereas lack of interest would lead to a certain collapse. (United States Consulate in Antwerp, September 4, 1959.)



Chile

CREDIT ASSISTANCE EXTENDED TO FISHING INDUSTRY:

The Chilean Government Development Organization has announced that it will extend credit assistance to the fisheries industry of the Provinces of Tarapaca and Antofagasta. Motors and fishing equipment will be imported by the Chilean Ministry of Agriculture and sold on credit to fisheries cooperatives legally established in these two provinces. Such purchases will be financed under the 5 billion pesos (about US\$4.7 million) fund established by the Law of Rehabilitation of the Departments of Iquique and Pisagua. The Government hopes to extend its plan for credit assistance to fisheries industries in other areas of the Republic.

The Development Organization provided a US\$500,000 allocation in its 1959 budget for use in facilitating the purchase of fishing boats. Authorizations have been made against this allocation, the United States Embassy in Santiago reported in an October 1959 dispatch.

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EXPORTS OF FISHERY PRODUCTS, 1955-1958:

Chilean exports of fishery products in 1958 set a new record--approximately 26.0 million pounds, valued at about US\$2.0 million. This was about 3.2 million pounds (14 percent) more than the previous peak year of 1955 during which exports amounted to 22.8 million pounds, valued at US\$1.2 million. The record 1958 exports were more than twice those exported during 1957 and also 1956.

During 1958, Chile increased its exports of frozen langostinos considerably and for the first time exported canned langostinos. The greatest increase in exports, however, was in fish meal. Exports of frozen tuna, which reached a

Chile (Contd.):

Chilean Exports of Fishery Products, 1955-58								
Product	195	88	1957		1956		1955	
	Quantity	Value	Quantity	Value	Quantity	Value		Value
	1,000	US\$	1,000	US\$	1,000	US\$	1,000	US\$
Fresh or Frozen:	Lbs.	1,000	Lbs.	1,000	Lbs. 821.3	1,000	Lbs.	1,000
Tuna	87.0	8.9	773.4	58.9	821.3	58.8	1, 158.5	83.8
Bonito	-	-	13.2	0.7	1, 195.0	29.3	-	-
Eel :	10.8	1.4	17.3	2.4	37.5	6.8	37.0	5.1
Swordfish · · · · · · · · · · · · · · · · · · ·	-	-	-	_	5.2	1.1	- 1	-
Langostinos	1,094.3	625.3	841.8	536.7	219.7	133.0	0.6	0.1
Shrimp	61.8	21.2	33.4	19.7	-	-	- 1	-
Spiny lobster	_	_	5.8	4.4	59.9	37.5	6.6	4.3
Other fish & shellfish	41.4	2.2	409.5	20.5	565.9	37.7	1,611.0	90.2
Canned:								
Fish	195.0	35.9	625.0	125.5	1,035.7	148.8	764.6	134.9
Langostinos	371.1	208.2	_	-	-	-	-	-
Crab	11.7	4.2	21.3	9.9	7.9	3.9	0.2	0.1
Other shellfish	50.7	18.9	283.9	175.2	111.3	40.7	107.1	
Fish meal	24, 108.1	1,072.4	9,933.8	453.9	9,802.6	335.3	19,079.2	872.0
Total	26,031.9	\$1,998.6	12,958.4	\$1,407.8	12,862.0	\$832.9	22,764.8	\$1,231.1
Note: Values for 1958 converted at 1	ate of 980 p	esos equal	US\$1.					
Values for 1957 converted at a								
Values for 1956 converted at rate of 547 pesos equal US\$1.								
Values for 1955 converted at a								

peak of 1.2 million pounds in 1955, declined in 1956 and 1957, and then fell sharply to only 87,000 pounds in 1958. (Boletin Informativo, No. 65, January 1959.)

Cuba

CLOSED SEASON FOR SNOOK AND CROAKER ENDED:

The National Fisheries Institute of the Cuban Maritime Development Agency terminated the closed season on the capture of snook (robalo) and Atlantic croaker (corvina) effective August 25, 1959. The closed season on these species originally commenced on May 5, 1959.

The Resolution embodying the above measure was published in the Official Gazette No. 154 of August 19, 1959.

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FISHERMEN AND PACKERS FIX SPINY LOBSTER EX-VESSEL PRICES:

A June 8, 1959, agreement between Cuban fishermen and packers fixed the ex-vessel prices at all ports: for a 60-pound box of whole and a 20-pound box of spiny lobster tails US\$11.50. The agreement was extended for 45 days on September 14, 1959, by a Cuban Government

Resolution published in Official Gazette No. 172.

The base price of \$11.50 is subject to deductions for shipping costs and for losses in weight from port to plant. The amount of these deductions will be determined by a three-man packing-plant committee made up of a representative of the fishermen, one for the packer, and a third representing the Government Maritime Development Agency.

A rumor persists that the Cuban Government plans to construct a fish and shellfish receiving plant on the shores of the Almendares River. Fishermen will be able to deliver their catches to the plant at prices established by the Government. The Government will then sell directly to the processors and eliminate the middleman. In this way the Cuban Government hopes to protect the fisherman from price fluctuations, according to a September 25, 1959, dispatch from the United States Embassy in Havana.

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SPINY LOBSTER POTS PROHIBITED ON THE NORTH COAST:

The National Fisheries Institute of the Cuban Maritime Development Agency published a resolution in the Official Gazette No. 172 of September 14, 1959,

Cuba (Contd.):

prohibiting the use of lobster pots. The restriction covers all the lobster fishing grounds including inlets, bays, harbors, keys, etc., on the northern coast of Cuba, between Key Bahia de Cadiz and Key Frances.



Egypt

SHRIMP IS PRINCIPAL PROCESSED FISHERY PRODUCT:

Egypt's principal processed fishery product is shrimp. Two large and two small factories located in Alexandria produce frozen raw and cooked shrimp. The entire amount of shrimp produced is exported to Italy, United States, Switzerland, and Greece.

Processed shrimp production in 1958 totaled about 350 metric tons, valued at EŁ118,000 (US\$338,896).

Although it is thought that Egypt's shrimp industry has a great potential, there has been little progress made.

With reference to other fisheries, during 1958 there was no production of sardines in Egypt, since the only factory that processes that species remained inactive throughout the year. In the latter part of 1958, negotiations were under way with the Japanese for installation of a large sardine canning factory.

Egypt produces small quantities of dried and salted fish for domestic consumption. (Industrias Pesqueras, July 1, 1959, Vigo, Spain.)



El Salvador

FISHERY TRENDS, OCTOBER 1959:

Exploitation of El Salvador's Pacific Coast marine fisheries, which began only recently on a commercial scale, is still a matter of great interest to businessmen interested in profitable diversification. Licenses have been granted for

several additional shrimp vessels, and the United States continues to provide the major market for the shrimp catch. Reliable figures on shrimp exports are not maintained, the best available being United States import statistics. According to these statistics, El Salvador exported 1,130,000 pounds (value US\$660,060) of shrimp in 1958 and 1,112,000 pounds valued at US\$649,000 in the first eight months of 1959.

Under present practices most of the catch consists of fish, which are thrown overboard by the crews, while only the shrimp are retained. Recently a Salvadoran group proposed that American investors might be interested in a fish meal and fish fertilizer project, which would use the discarded fish as a raw material. Fish flour could provide a valuable supplement to local diets, which are strikingly low in protein.

The Food and Agricultural Organization (FAO) for some time has been considering establishing a regional Fishery Research Institute for Central America, and this plan was discussed at the recent meeting of Central American Economic Ministers in San Jose, Costa Rica. Due to the lack of fisheries organizations in the various countries, however, it appears likely that such an institute will not be possible for some time, with more attention probably needed to build local skills in each country first. (United States Embassy dispatch from San Salvador dated October 15, 1959.)



French West Africa

TUNA FISHERY, 1958/59:

Landings of tuna at Dakar, French West Africa, for the season which opened on December 1, 1958, and ended on March 31, 1959, amounted to 6,957 metric tons. About 4,500 tons of the seasonal tuna landings were processed by the five local tuna canneries and the balance was frozen and shipped to France.

The catch was considered satisfactory in view of the decision of the French Merchant Marine Agency of November 7,

French West Africa (Contd.):

1958, which called for a minimum catch of 6,000 tons by the French mainland tuna clippers, two thirds of the catch to be processed in Dakar and the remainder sent to France.

A total of 23 vessels participated in this season's activities. Twenty came from French fishing ports: 9 from Concarneau, 4 from Sables d'Olonnes, 3 from Ethel, 2 from Bayonne, 1 from Croix, and 1 from La Rochelle. The other three were Senegalese vessels.

Despite the smaller catch, the season proved much more profitable than that of last year, during which 95 vessels landed only 9,500 tons.

Tuna fishing out of Dakar has been aided by the cold-storage facilities of the port which has 30,000 square meters of refrigeration space and also space for the dressing of the tuna before freezing, according to an August 31, 1959, dispatch from the United States Consulate in Dakar.



German Democratic Repubic

FISHING INDUSTRY PROVIDES ONLY 25 PERCENT OF NEEDS:

Despite its large fishing fleet, East Germany's fishing industry can only provide 25 percent of the fishery products needed to supply the demand. This is blamed on technical inadequacies of the fishing fleet and the long voyages that have to be made by vessels to reach the fishing grounds. As a result, the demand for fishery products cannot be satisfied domestically and East Germany can only use half of its actual processing potential for fishery products.

East Germany has petitioned for the use of the Russian port of Murmansk as a base for fishery operations. Russia has not heeded the petition.

Plans have been made for the construction of several factoryship-trawlers which can stay at sea for periods of two months, but these vessels will not be in service before 1965. (Allgemeine Fischwirtschaftszeitung, a West German fishery periodical.)



German Federal Republic

EXPLORATORY FISHING FOR 1959/60 PLANNED:

The West German Federal Government has appropriated DM475,000 (US\$114,000) to finance exploratory fishing by otter trawlers.

According to the Federation of the German Deep-Sea Fisheries in Bremerhaven, this amount will cover the expense of seven exploration trips. Commercial fishing trawlers will be used. The search for new fishing grounds will be combined with commercial fishing. Trawler operators will be guaranteed gross daily proceeds of up to DM5,000 (about US\$1,200), to be offset by receipts from the sale of the fish caught during the trip.

Three trips were made during the fall of 1959 to Northeast Atlantic waters, off the coasts of Newfoundland, North Labrador, and South and Southwest Greenland. Two trips to Southwest Greenland waters will be made in the spring of 1960.

The West German exploratory fishing program also included two trips into the North Sea during the 1959 fall herring season to test mid-water trawling.

In all instances, the trawlers will carry scientists of the West German Federal Fisheries Research Institute.

The results of the searches will be relayed immediately to trawler operators to ensure maximum practical results of the program, the United States Consul at Bremen reported on October 6, 1959.

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FISHERY LANDINGS, 1958:

During 1958 the West German fishing fleets landed 651,179 metric tons (close to 1,435 million pounds) of fish and shell-fish. About 46.8 percent of the total landings came from the North Sea area, about 18.2 percent from the grounds off Iceland, and the balance from widely-scattered fishing grounds between Bear Island and the Barents Sea, off the north-ern tip of Norway, to waters off Laborador. The landings from the newly discovered fishing banks off the coast of Laborador and Newfoundland accounted for about 3.3 percent of the total 1958 landings.

trawler to a fishing company located in the same city. This is the second ship of this type of trawler built by this company and the fourth ship of its kind now operating in West Germany. The first stern trawler Heinrich Meins was placed into service in May 1956. Its Voith-Schneider propellers caused considerable trouble, and were finally replaced by conventional propellers.

The new trawler is reported to be an improved version of the Heinrich Meins. The ship is powered by a 1,650 hp. Diesel driving conventional propellers. Its cruising speed is stated to be 15 knots. The measurements of the trawler are as

West German Fishery Landings, 1958, by Principal Species and Fishing Grounds								
Fishing Ground	Herring	Cod	Haddock	Coalfish (Pollock)	Ocean Perch	Shrimp and Crabs	Other Species	Total
				. (Metric T	ons)			
North Sea	185, 124	3,475	2,734	8,944	4	28, 372	75,905	304,558
British Channel	8,990	14	3	12	-	-	757	9,776
West British waters	14,267	261	194	356	- 1	-	1,363	16,441
Baltic Sea	18,926	11,819	-	3	-	-	9,291	40,039
Kattegat	69	187	4	4	_	98	323	685
Iceland	-	27,597	4,753	17,960	52,076	-	15,827	118, 213
Norwegian Coast	28	11,077	4,899	17,630	7,908	_	2,774	44, 316
Barents Sea	-	563	63	127	534	-	83	1,370
Bear Island	-	1,722	78	154	4,481	-	373	6, 808
Greenland	-	20,047	68	104	15,718	-	1,700	37,637
Faroe Islands	-	529	10	2,477	2,676	-	1,432	7, 124
Newfoundland	-	291	212	602	73	-	144	1, 321
Labrador	_	513	-	8	19,086	-	417	20,024
Other fishing grounds	12,846	6,280	668	4,550	12,980		5,542	42,866
Total	240,250	84,375	13,686	52,931	115,536	28,470	115,931	651, 179

In 1958, for the first time, West German trawlers caught significant catches of herring off the east coast of Ireland -close to 6 percent of the 1958 herring landings came from that area. West German landings of herring from the traditional herring fishing grounds in the North Sea and English Channel dropped from 93 percent in 1957 to 81 percent in 1958. Lower landings of ocean perch from the Norwegian, Bear Island, and Greenland fishing grounds were offset by increased catches made on the Icelandic and Labrador grounds. Another shift in 1958 was increased cod landings made in the Iceland and Greenland areas instead of in the Baltic, Bear Island, and Barents Sea.

FOURTH STERN-TYPE TRAWLER PLACED IN SERVICE:

On September 24, 1959, a Bremerhaven shipyard delivered a new stern

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follows: over-all length 67.25 meters (220.6 feet); length between perpendiculars 57.60 meters (188.9 feet); moulded breadth 9.60 meters (31.5 feet); moulded depth up to main deck 7.15 meters (23.5 feet); and moulded depth up to second deck 4.90 meters (16.1 feet). The fishhold capacity is 280 metric tons. In addition, the ship has a separate refrigerated hold of 64 cubic meters to store frozen fish. It is equipped with fish processing and freezing equipment. (United States Consul in Bremen, September 30, 1959.)

GEAR EXPERT DEMONSTRATES IMPROVED MIDWATER TRAWLING:

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Promising catches of herring and sprat have been made by West German fishing vessels with a new type of one-boat midwater trawl gear, consisting of a high-opening nylon net, hydrofoil otter boards, and an echo-sounder oscillator attached

to the headline of the net for continuous trawl depth indication and fish detection.

This method has been perfected by a gear technologist on the staff of the Fisheries Division of the Food and Agriculture Organization (FAO), Rome. It is based on experimental work carried out by the technologist when a member of a Hamburg, West German, research institute.

The technologist states: "I was loaned by FAO to the West German Institute in December 1958 to carry out midwater trawling experiments with a typical German North Sea cutter. These boats are about 24 meters (78.7 feet) over-all, powered with 150 hp. engines. When trawling in midwater the cutters usually work in pairs, two boats towing one net between them. In Germany there is also a rather primitive one-boat method using conventional otter boards which are kept at the desired depth by attaching them to big surface floats. In our experiments we concentrated on improving the oneboat trawl.

"The main problem in midwater trawling has been to tow the net at the proper depth to catch the fish, and control the net so that it can be quickly raised or lowered as desired. As you know, the shorter the warps and the higher the towing speed, the higher the net will travel through the water. But this general rule applies only to a small degree to the oneboat trawl where the depth of the net has to be adjusted by changing the length of the warps connecting the otter boards with the surface. Furthermore, accurate adjustment of the net to the actual depth of the fish requires continuous indication of the depth of the net, so that the proper action can be taken in time."

The basic idea of his method is not new. It consists of attaching an oscillator (transducer) to the net and connecting it by cable to the echo-sounding unit installed on board.

An echo-sounder oscillator attached to the bosom part of the headline to sound downwards indicates not only the depth

of the net, but also the position of the footrope and the fish in the net-opening and below the net, as well as the sea bottom.

"This enables the fishermen to know the depth of the net, check if the gear is operating properly, and to see if the fish in the path of the net are really caught," said the technologist. "With some experience, he should be able to estimate the rate of catch and so determine the right time for hauling. These very obvious advantages make it much easier to accept the slight trouble of handling an extra cable."

The experimental net had an opening height of 8 to 10 meters (27 to 33 feet) and, to improve its maneuverability, hydrofoil otter boards, designed in Hamburg, were used. These provide a good sheer at a considerably lower drag as compared with the conventional boards. The warp is attached above the center of the board which gives an inward tilt, the lift varying with the towing speed. This increases considerably the influence of speed variations on the depth of the net, and enables the skipper to regulate the the depth through engine control.

This new gear combination enables the skipper to practice "aimed" fishing in what has hitherto been mostly a blind operation.

The skipper of the cutter chartered for the experiments was soon able to handle the gear and, since the experiments, has successfully fished with it on a commercial scale. He has often caught the same amount, or even more, than have the pair-trawl boats fishing nearby.

German deep-sea trawler companies are very interested in midwater trawling for herring, particularly as an additional method for craft of 400 to 500 BRT and 600 to 800 hp., which are not suitable for fishing on the distant grounds off Greenland, Newfoundland, and Labrador.

"Considering the promising results of the cutter experiment," the technologist stated, " it was advisable to test this type of gear with a medium-size deep-sea trawler, too. The experiments were carried out with a steam trawler

of 4,000 BRT and 600 hp, in the northern North Sea during February 1959. Avery big and light nylon trawl was made which worked with an opening height of 12 to 14 meters (39.4-45.9 feet). We used basically the same echo-sounder oscillator arrangement but with an automatic electric winch essential for handling the 400fathom cable needed for fishing at about 110 fathoms."

The method proved to be applicable for these bigger craft and valuable experience was gained for future improvements. Catches of up to $3\frac{1}{2}$ tons of herring per haul were made which were considered fairly good in view of the limited size and density of the schools present.

An interesting innovation was tested during these trials, that of an oscillator on the trawl headline transmitting concurrently up to the surface and down to the bottom. This gives the skipper much better information on the actual trawl depth. Irregularities of the bottom profile may be mistaken for net movements and vice versa, but the indication of the trawl's distance from the surface eliminates this difficulty completely.

The result of these experiments, financed by the German Ministry of Agriculture on request of the German fishing industry, is a big step forward in improving the technique of commercial midwater trawling.

It is likely that this method of "aimed" trawling may lead to exploiting pelagic fish resources which have not been, or only to a limited extent, fished so far. (Canadian Trade News, July 1959.)

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IMPORTS AND EXPORTS OF MARINE OILS, 1958 AND JANUARY-JUNE 1959:

Imports: During 1958 West Germany imported 78,820 metric tons of whale oils, valued at US\$16.7 million (DM69,855,000), and 64,334 tons of fish oils, valued at US\$12.1 million (DM50,633,000). Whale oil imports in 1958 increased over the preceding year. but fish oil imports were lower. The shift of the West German edible fats and oils industry to higher-quality oils for use in the manufacture of margarine continued in 1958. The chief suppliers of whale oils to the West German market were the leading whaling countries with about 35.9 percent of the 1958 imports supplied

West Germany's Imports and Exports of Marine Oils, 1958 and JanJune 1959								
		Whale	Oils		Fish Oils			
Country of Origin	19.	58	JanJur	ie 1959	19.	58	JanJune 1959	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Metric	US\$	Metric	US\$	Metric	US\$	Metric	US\$
	Tons	1,000	Tons	1,000	Tons	1,000	Tons'	1,000
Imports:								
Angola		-	-	-	6,992	1,211	3,097	458
Argentina	692	136	-	-	38	7	-	-
Australia	3,611	738	353	73	-	-	-	-
Chile	941	195	-	-	74	11	-	-
Denmark	244	41	-	-	2,344	410	1,594	274
Great Britain	3,328	651	1,572	295	508	94	584	108
Iceland	3, 394	697	490	93	7,527	1,466	251	47
Japan	24,437	5,220	24,547	5,061	_	-	3,790	710
Netherlands	3,744	774	1,795	275	2,786	488	714	116
Norway	28, 287	6,039	26,969	5,489	7,643	1,657	2,433	428
Panama	7,920	1,756	_	_	_	_	_	-
Peru	937	162	836	127	912	159	3,829	544
Portugal	644	132	-	-	1,887	304	1, 137	154
Union of South Africa	17	4	-	_	9,241	1,632	1, 198	202
United States	624	130	871	162	21, 294	4, 103	9,927	1,761
Other	-	-	9	2	1/3,088	1/545	$\frac{2}{1,682}$	2/295
Total	78,820	16,675	57,442	11,577	64, 334	12,087	30, 236	5,097
Exports:					0.4			
All countries	268	76_	492	16	$\frac{3}{14,715}$	2,839	7,094	1,241

1/ Includes 1,645 tons valued at US\$320,000 from Canada.

2/ Includes 1, 123 tons valued at US\$209,000 from Canada in Jan.-June 1959.

Shipped principally to Sweden (7,005 tons), Denmark (3,948), Netherlands (1,611), Norway (1,870), and the balance to a number of other countries. Note: Values converted at rate of 4,189 Deutschmarks = US\$1 for 1958 and 4,180 Deutschmarks = US\$1 for Jan.-June 1959.

by Norway and about 31.0 percent by Japan (see table on previous page). The United States was the largest supplier of fish oils to Germany--about one-third or 21,294 tons out of the total imports of 64,334 tons in 1958 came from the United States.

In the first six months of 1959 imports of fish oils from the United States remained at about a third of the total imports of 30,236 tons, but imports from Peru and Japan were up sharply.

Exports: Exports of whale oils by West Germany were negligible and amounted to only 268 tons in 1958. However, in 1958 about 22.9 percent, or 14,715 tons, of fish oils were exported. These exports were chiefly to nearby countries in Western Europe.

Prices: Average cost per metric ton of whale oil in 1958 was close to \$211.56 as compared with an average of \$201.54 for imports made during the first six months of 1959. Fish oil price average for 1958 was about \$187.88 a ton, or about \$19.31 a ton higher than average prices for the first six months of this year.

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PRODUCTION METHODS FOR FISH FLOUR DEVELOPED:

A firm in Bremerhaven, West Germany, has developed methods and equipment for the manufacture of fish flour for human consumption in collaboration with the Food and Agriculture Organization. The project was planned to develop protein supplements for addition to diets of the populations in countries lacking sufficient animal protein.

The German firm claims that its product contains 65-70 percent animal protein, B vitamins (including B_{12}), calcium, and phosphorus. The moisture content of the fish flour is stated to be 2-3 percent. The fish flour can be completely and permanently deodorized or may be produced with a fish flavor. Because of its low fat content amounting to only 0.2-0.3 percent, fish flour packed

in a vacuum may be stored for at least one year without deterioration of its quality. It is claimed that a total of 49 nourishment tests conducted in 14 tropical or semi-tropical countries have yielded positive results.

At the present time, the Bremerhaven firm is negotiating with foreign interests for the sale of a combined fish flour and fish meal plant. (United States Consulate dispatch from Bremen, dated October 6, 1959.)



Iceland

FISHERIES TRENDS, SEPTEMBER 1959:

The larger part of the Icelandic trawler fleet, which began fishing off Newfoundland two months early this year, found ocean perch operations rather poor in September. An Icelandic trawler which has been conducting fisheries research in the area since August has still failed to locate new ocean perch grounds.

Some new markets for frozen ocean perch fillets have been opened up in the United States and in West Germany, but Russia has still failed to purchase an additional 6,000 metric tons of these fillets, as proposed by the Icelanders.

While German trawlers are engaged in the North Sea herring fishery, four Icelandic trawlers have begun supplying West German ports with iced fish from Greenland-Iceland waters, the United States Embassy in Reykjavik reported on September 25, 1959.

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HERRING FISHERY AND WHALING TRENDS, SEPTEMBER 1959;

The Icelandic south and southwest coast drift-net herring season was off to a slow start as the herring schools failed to appear. Pessimism is already being expressed regarding ability to fill large orders for salted herring now under contract and negotiation with the Soviet Bloc. It is a foregone conclusion that no significant amount of salted herring will be sold this year in the United States.

Iceland (Contd.):

An unusually poor whaling season closed on September 28, 1959, with a total of 371 whales landed as compared with 508 in 1958, and 517 in the very good year of 1957, the United States Embassy in Reykjavik reported on October 9, 1959.

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MARKET FOR SOUTH COAST HERRING IN SOVIET BLOC IMPROVED:

With Iceland's south coast herring season under way in September, the Icelandic Herring Production Board expressed optimism regarding negotiations for sales to the Soviet Bloc of 90,000 barrels of salted herring. This approximates the entire amount of the catch salted for export in 1958 and is 10,000 barrels greater than advance Bloc contracts in 1958. Russia has indicated readiness to buy 20,000 barrels in addition to the 40,000 barrels of south coast herring already contracted for; the Poles have expressed some interest in buying 20,000 barrels, and the East Germans, 10,000 barrels.

If these sales materialize, Soviet Bloc salted herring purchases (including 80,000 barrels from the north coast by the U.S.S.R.) will amount to 170,000 barrels valued at about Ikr. 57 million (US\$3.5 million).



India

RUSSIAN FISHERY BIOLOGIST TO SURVEY BAY OF BENGAL:

A member of Soviet Russia's Research Institute of Marine Fisheries and Oceanography has arrived in India on an assignment as marine fishery biologist on behalf of the Food and Agriculture Organization (FAO), Rome, Italy.

In an interview at FAO Headquarters before leaving for India, the Russian biologist stated: "My principal work will be to advise the Indian Government on exploratory fishing in the Bay of Bengal and to assist in carrying out a survey of demersal stocks in the Bay and in adjacent waters."

His work will be in addition to, and will supplement, the work carried out by a number of FAO fisheries experts in India during the past few years.



Iran

FISHERIES TRENDS, SEPTEMBER 1959:

The joint Iranian-United States shrimp fishing company has 10 shrimp vessels operating in the Bandar Abbas area, and the local agent reported that the catch is very large. The shrimp are frozen and packed for shipment to the United States on board one of the larger vessels and transferred to ocean-going cargo vessels at Bandar Abbas; thus, there are no adequate statistics on the catch. The shrimp vessels are provisioned from Khorramshahr by a small chartered coastal freighter. The mothership scheduled to arrive from Houston, Texas, had not appeared as of the end of September.

A joint Japanese-Iranian company was set up about four years ago, first with private Iranian capital and then with the Plan Organization. The Japanese did not work well with the Iranians and withdrew their boats about a year and a half ago. Since that time the company, whollyowned by the Plan Organization, has continued limited operations, buying fish from local boats in Abadan and renting freezer space in Customs. Now, if funds can be obtained from the Plan Organization, more intensive operations may be resumed. In view of the demands made upon the Plan Organization from its other projects, it is questionable that much money will be available for the fisheries, the United States Consulate in Khorramshahr reported on October 1, 1959.



Japan

CANNED TUNA-IN-BRINE EXPORTS TO UNITED STATES, JANUARY-MAY 1959:

During the first five months of 1959, Japan exported 124,690 standard cases (48 7-oz. cans per case) of canned white

Japanese Canned in Brine Tuna Exports to United States, January-May 1959							
Type Actual Standard Canners' Cases Cases 1/ Value (USS							
White meat in brine .	119,275	124,690	1, 190, 891				
Light meat in brine - 71,799 75,040 537,822							
1/487-oz. cans.							

Note: These data may differ from published United States import data since United States data do not seem to accurately classify white meat and light meat.

meat tuna-in-brine and 75,040 standard cases of canned light meat tuna-in-brine to the United States. Prices per standard case for white meat tuna-in-brine at the canners' level averaged about US\$9.55 and for light meat tuna-in-brine about US\$7.17 per case.

* * * * *

PLANS FOR 1959/60 WHALING SEASON:

The Japanese whaling industry has announced its intention to send out the same six fleets as last year and to limit its catch to the 1958/59 level or 5,037 bluewhale units. According to reports reaching Japan, Norway plans to take 5,900 units, the Netherlands 1,200, the United Kingdom 15/80 (about 2,812 blue-whale units) of the total planned catch, and the Soviet Union 20 percent of the total. It is estimated that these plans may result in a total catch of about 18,000 blue-whale units or 3,000 more than the Whaling -Commission's 1958/59 quota limit, which many biologists considered was already too high for proper conservation of the whale populations. The Japanese Government will wait for the reaction of the European whalers to the Japanese industry's plan before giving its official sanction, and some slight optimism still seems to be felt that when the industries of the five whaling nations realize the full implications for the future of this excessive whale catch, they may reexamine the possibilities of a reasonable compromise on apportionment of the catch.

The question is beginning to arise in the Japanese industry as to whether the six Japanese fleets will continue to compete freely with each other under their national quota in a miniature version of the former "Whaling Olympics" or whether a system of catch allocations will be set up within the Japanese industry. A decision on this potentially stormy question will likely be left until just before the whaling season, the United States Embassy in Tokyo reported on September 17.

Since the withdrawal of the Netherlands and Norway from the International Whaling Convention in July of 1959, there has been much speculation as to how the catch of whales might be regulated in the 1959/60 Antarctic whaling season. In the past the fleets of the five Antarctic whaling powers--Japan, the United Kingdom, Norway, the Netherlands, and Russia -have competed freely for their share of the 15,000 blue-whale-unit catch limit set by the International Whaling Commission. A growing dissatisfaction with this system on the part of the European whalers led to a number of meetings since last winter at which the whaling industries tried to work out a formula for apportioning the permissible catch among the five nations. When these efforts failed, Norway and the Netherlands withdrew from the Convention, and the catch limitation imposed in the past by the Whaling Commission became essentially a deadletter.

* * * * *

RESIN-LIKE SUBSTANCE FROM FISH OILS DEVELOPED:

Experiments conducted in Japan have shown that chlorination of fish oil results in the formation of a resin-like substance which seems to be a promising main ingredient of coatings such as varnish. Fish oil, which is previously treated with alkali to remove free fatty acids, is dissolved in CCl₄ (carbon tetrachloride) and chlorine gas is bubbled through it. The resulting product is a white, odorless powder, soluble in most organic solvents except in lower alcohols and ligroin. The product is stable and a solution in toluene is transparent, slightly yellow and forms a glossy, waterproof film. The film is durable and not corrosive to iron, copper, and aluminum

Japan (Contd.):

(Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958).



Korea

FISHERIES TRENDS, AUGUST 1959:

The Central Fisheries Experiment Station in Korea has received initial contacts from two seafood companies in the United States requesting sample shipments of Korean frozen fish products.

One Korean company has completed its frozen fishery products processing facility at Pohang. The facility was inspected and approved under the new frozen fishery products inspection regulation of Korea. In addition, processors in the Pohang-Kampo area were preparing frozen shrimp for export against a \$30,000 order from the United States.

The commercial shrimp vessel Pyung Namho, operating under the guidance of Experimental Station technicians, reported average catches of over one metric ton per day of whole mixed size shrimp. One day's catch totaled 70 boxes (probably about 22 pounds per box) of jumbo, 63 boxes medium, and 30 boxes small. This compares to 20 boxes formerly considered a good day's catch. This vessel is working on fishing grounds developed by Experimental Station vessels under the United States Operations Mission shrimp development program.

The two tuna long-line vessels also purchased under the 1957 boat procurement project completed their first trip and reported full loads of 55 tons each in 21 days. (United States Operations Mission, Korea, report of September 28, 1959.)

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REVIEW OF FISHING INDUSTRY, 1958:

The Korean fisheries industry supplies an estimated 85 percent of the animal protein consumed by the Korean people. It is also an important source of foreign exchange, providing about 20 percent of the total value of Korea's exports.

Despite improvements in the industry and increased production, the Korean fishing industry still faces great problems. Methods of fishing, vessels, and gear must be modernized. Available finances are limited. Marketing facilities and sanitary standards must be improved, especially for the export market. The Korean government is assisting and encouraging the industry, but the achievement of desired goals will be slow. (United States Embassy in Seoul, report dated September 10, 1959.)

Production of Marine Products: The source of Korean marine products are (1) coastal and off-shore fisheries and (2) aquiculture. The former includes the production of fish, shellfish, seaweeds, and other aquatic animals and plants from coastal

Ta	Table 1 - Korea's Production of Marine Products, 1954-19581/							
-		1501	1000-)					
				Other				
Year	Fish	Shellfish	Seaweed	Aquatic	Total			
				Products	20002			
—								
		(1	Aetric Ton	s)				
1958	291, 191	15,884	28,759	59, 359	395, 193			
1957	279,768	12, 187	34,798	76,405	403, 158			
1956	257,518		24, 424	49, 197	340,917			
1955	190,424	6,799	20,019	41,992	259, 234			
1954 188,941 10,455 17,253 32,887 249,536								
1/Exclusive of aquiculture and agar-agar production, and								
tun	a landing	in Americ	an Samoa		·			

waters of the Republic of Korea. This is the mainstay of the Korean fisheries industry, providing annually about 95-98 percent of the total marine products landed in the country. Production from aquiculture refers to the culture of oysters, clams, and other shellfish and seaweeds.

Total landings of marine products in 1958 were 403,412 metric tons, approximately 1.5 percentless than the previous year but still substantially above the annual production of any other year since 1950. Of this year's production, 395,193 tons, or almost 98 percent, came from coastal and offshore fisheries, the rest (8,219 tons) from aquiculture.

The marine products from coastal and offshore waters in 1958 totaled 395,193 tons, a decrease of 2 percent from 1957. Compared with 1957 production by class of product, production of fish increased 4 percent and of shellfish 30 percent, while production of seaweed and other aquatic plants and animals decreased by 17.4 percent and 22.3 percent, respectively.

Of the coastal and offshore fisheries landings in 1958, fish constituted 73.7 percent with 291,191 tons; shellfish 4.0 percent with 15,884 tons; seaweeds 7.3 percent with 28,759 tons; and other aquatic plants and animals 15 percent with 59,359 tons.

The value of the total landings of various products in 1958 was estimated at about Hw50.3 billion (US\$60.6 million at the official exchange rate of Hw500 equals US\$1).

Total value of the 1958 production of coastal and offshore fisheries is calculated at Hw28.7 billion (US\$57.4 million at the official exchange rate of Hw500 equal \$1). This amount was 10.8 percent greater than the 1957 value and included Hw 24 billion (\$48.0 million) for fish, Hw1.1 billion (\$2.2 million) for shellfish, Hw0.9 billion (\$1.8 million) for

Korea (Contd.):

seaweed and Hw2.7 billion (\$5.4 million) for other aquatic animals and plants.

The most important species of fish by volume caught in 1958 were saury-pike, horse mackerel or bluefin tuna, Alaska pollock, anchovy, yellow croaker, and hairtail. As compared to 1957, the

Table 2 - Korean Production of Coastal and Offshore Fisheries by Important Species					
Product	1958	1957	1956		
Fish:	(1	Metric Ton			
Flounder (flatfish)	9,450	6, 166	6,279		
Mackerel	5,793	12,788	13,931		
Saury-pike	20,651	22,872	14,734		
Horse mackerel					
(bluefin tuna)	48,361	13, 138	10, 490		
Alaska pollock	39,336	43,438	30,954		
Anchovy	37,834	34,679	29,056		
Yellow croaker					
(corvenia)	24,585	34,838	33,045		
Hair-tail	30,555	38,611	48, 220		
Bastard halibut	2,720	2,598	2,428		
Sand launce	4,399	7,336	2,839		
Shark	7,926	7, 160	8,821		
Other fish	59,580	56, 144	56,721		
Total	291, 191	279,768	257,518		
Shellfish:					
Short-necked clam	2,279	1,260	1, 119		
Sea mussel	3, 162	1,897	1, 125		
Oyster	2,083	1,565	1,548		
Stiegele mussel	1,714	1,602	366		
Spiny whelk	1,074	1,517	855		
Abalone	1,617	842	573		
Head clam	498	457	1,003		
Heart clam	1,456	846	168		
Other shellfish	2,001	2,201	3,021		
Total	15,884	12, 187	9,778		
Other Aquatic Animals					
and Plants:		1	İ		
Cuttlefish	33,519	39, 455	21,755		
Shrimp	16, 296	25,672	17,588		
Whale	1,233	2,587	2,226		
Prawn shrimp	637	808	760		
Crab	1,493	1,243	832		
Octopus	2, 152	1, 109	1,650		
All others	4,029	5,531	4, 387		
Total	59,359	76,405	49, 198		
	395, 193	403, 158	340,917		

decreased catch of particular species was attributed to unfavorable currents and/or temperatures, while the tremendous increase in horse mackerel production was due to the discovery of a new fish resource in the vicinity of Mooksan Island. The decrease in production from coastal and offshore fisheries of seaweeds and other aquatic plants and animals is attributed to adverse currents and temperatures, and price developments in domestic markets for certain species.

In addition to the products of coastal and offshore fisheries, Korea raises such products as oysters, clams, abalone, and other shellfish and seaweeds. Shellfish are raised by sowing seeds in definite culture grounds, and seaweeds by placing brush or netting for collection of spores in coastal waters.

During 1958 Korea obtained 8,219 tons of marine products from aquiculture. This amount was 34 percent greater than in 1957. The outstanding fea-

Table 3 - Korean Production from Aquiculture by							
Important Species							
Commodity	1958	1957	1956				
	(Metric Tons)						
Laver	737	640	1,059				
Oyster	6,215	4,400	3,453				
Short-necked clam	168	124	584				
Abalone	20	1	-				
Cockles	645	500	340				
Others	434	460	218				
Total	8,219	6, 125	5,654				

ture of aquiculture production in 1958 was the 41 percent increase in the oyster yield, the production of which the Government is trying to encourage. Methods of encouragement include financial loans and allocations of materials to build new culture grounds. In 1958 the Office of Marine Affairs built 1.9 million pyung (1,552 acres--1,224 pyung equals 1 acre) of new culture grounds with 280 million hwan (\$560,000) from the National Treasury Subsidy Fund and 1.3 million pyung (1,062 acres) with 182 million hwan (\$364,000) from the 8th Reconstruction National Bond Fund, or a total of 3.2 million pyung (2,614 acres) with 462 million hwan (\$924,000).

Not included in the data above are an estimated 280 metric tons of tuna caught in 1958 by the Koreans in deep-sea fishing in the vicinity of American Samoa. The catch, valued at roughly \$70,000 was sold to the United States firm operating the cannery on that island. The Office of Marine Affairs does not include the results of the deep-sea fishing operation, which began in 1957, in its statistics on the Korean fishing industry.

Utilization of Marine Products Within the Country: No detailed or accurate information is available on the utilization of marine products within Korea. The Office of Marine Affairs states that of the total catch of 403,000 tons in 1957, 11,000 tons were exported and 392,000 tons consumed domestically in the form of fresh or processed products. Of the 8,800 tons of canned products, 95 percent was consumed by the Korean military forces; 4.8 percent was sold on domestic markets; and the balance of about 0.2 percent was exported. Statistics show that there was a limited production of fertilizer from fish, probably less than 100 tons. Some locally-produced shell is used in the manufacture of cheaper inlaid lacquer products, but for specialty and export items a finer shell is imported.

Marine Products Processing Industry: A total of 65,270 tons of processed fishery items was produced by Korea in 1958, including 62,851 tons of food products and 2,419 tons of nonfood items.

In 1958 Korea had 38 marine products canneries licensed by the Office of Marine Affairs. The total capacity of these plants is estimated at 35 million cases or about 52,000 metric tons. Most of the plants are said to be equipped with modern facilities. The daily capacities of the individual plants vary from a minimum of 300 cases to a maximum of 1,350 cases for an 8-hour day. During 1958 two model plants were erected with about \$325,000 of FY 1954 UNKRA funds. The capacity of each plant was estimated at 75,000 tons for an 8-hour day, 20 days a month, 6 months a year.

Production of canned marine products in 1958 amounted to 593,277 cases (8,855 tons). Of this

Korea (Contd.):

Table 4 - Korean Fishery Products Cured and/or Processed					
Commodity	1958	1957	1956		
Food	(1	Aetric Tons	5)		
Canned	8,855	8,487	8,810		
Sun-dried	12,512	12,322	8,434		
Salted and dried fish .	2,068	2,867	2,426		
Products fermented in					
brine	14,619	19,233	16,622		
Salted fish	12, 326	14, 246	13,591		
Boiled & dried	9,063	8, 867	8,412		
Edible seaweed	3,408	5,088	4,616		
All others	_	30	25		
Total	62,851	71, 140	62,936		
Nonfood					
Fish oil	353	237	624		
Seaweed	1,976	2,642	2,053		
Others	90	8	59		
Total	2,419	2,887	2,736		

total 92 percent consisted of three items: horse mackerel or bluefin tuna, saury or mackerel-pike, and fish balls.

Agar-agar Production: South Korea has 45 natural agar-agar plants of which only 25 operated during 1958 with a total production of 250 metric tons. Three synthetic agar-agar plants, financed with \$635,000 of 1955 ICA funds, produced a total of 109 tons. Agar-agar is not included in the processed products totals issued by the Office of Marine Affairs.

Production of Frozen Fish Products: Koreahas 67 ice-freezing and cold-storage plants with the following daily capacities: ice making 1,557 metric tons; freezing 275 tons; cold-storage 8,415 tons; and ice storage 23,652 tons. Although the Office of Marine Affairs lists production of frozen marine products as 10,327 tons of fish and 90 tons of shrimp, only about 33 percent of this amount was quick-frozen, the remainder being merely stored

in ice or cold-storage plants. The quick-frozen products were produced in 27 plants with a combined capacity of 275 tons per day. The Office of Marine Affairs does not include frozen products in its statistics on processed products.

Production of Fish Oil: Korea's 42 fish-oil plants are all quite small, having a combined annual capacity of only 700 tons. These plants produced 353 tons of fish oils in 1958.

Foreign Trade in Marine Products: Exports of marine products from Korea during 1958 totaled 11,048 tons, 12,3 percent greater than in 1957. These products were valued at US\$3,670,374, 6.8 percent more than 1957 fishery export sales and 22 percent of the total value of all exports from Korea in 1958. The disproportionate increase in quantity compared to the lesser increase in value of exports was attributed to a drop in foreign market prices for Korean marine products, as also happened in 1957.

Japan was the largest importer of Korean fishery products taking 7,789 tons worth \$2.3 million, followed by Hong Kong with 2,891 tons worth \$1 million. These two markets combined purchased 97 percent by volume and 91 percent by value of Korea's fishery exports. The United States was the third largest buyer with 301 tons worth \$285,000 followed by Singapore--35 tons worth \$28,000 and the Republic of China--28 tons worth \$8,500. England, Australia, West Germany, Italy, and the Ryukyus, in that order, were markets for insignificant amounts of Korean marine exports.

International Problems: Korea's differences with Japan over the "Rhee or Peace Line" remain unsettled. This line, established by presidential proclamation on January 18, 1952, closes off waters ranging from 10 to 200 miles off the Korean coast. Purportedly it is designed for: (1) fishery conservation; (2) protection of Korea's security; (3) protection of mineral resources of the contin-

Table 5 - Korean Quantity and Value of Fishery Exports by Commodity1/							
Commodity	1958		1957		1956		
	Metric	US\$	Metric	US\$	Metric	US\$	
	Tons	1,000	Tons	1,000	Tons	1,000	
Frozen & fresh fish	2,576	713	3,311	693	3,103	554	
Frozen shrimp	59	73	20	20	-	-	
Dried shrimp	9	12	318	90	13	17	
Dried anchovy	-	-	48	22	-	-	
Dried cuttlefish	4,433	1,427	2,943	1,229	307	110	
Dried oyster	12	11	40	41	40	33	
Other dried fish	39	38	110	100	176	142	
Salted and boiled fish	_	-	5	3	-	-	
Laver <u>2</u> /	8	41	21	91	150	601	
Agar-agar	266	634	227	586	336	820	
Fish-liver oils	369	147	119	67	27	30	
Inedible seaweeds	2,995	424	2,484	378	1,980	482	
All others	280	148	189	114	162	111	
Total	11,048	\$3,670	9,837	\$3,435	6,298	.\$2,899	

1/Figures may not add up to total because of roundings.
2/The figures shown above for laver exports in 1957 are 189 tons and \$810,000 less than were shown in report of that year. This amount of laver was shipped to Japan and originally included in the 1957 export statistics. However, the laver was not released from Japanese customs warehouses and payment effected until 1959. Therefore the 1957 export figures were reduced by that amount. Presumably this tonnage and value will be shown in export statistics for 1959.

Korea (Contd.):

ental shelf. Korea continues to seize Japanese fishing vessels and crews found within this line.

As in previous years, a number of Korean fishermen and their vessels were seized in 1958 by Communist gunboats operating out of harbors in North Korea. It is believed that most of these fishermen were released after some subjection to Communist propaganda.

As a result of the controversy over the repatriation to north Korea of Korean residents in Japan, the Republic of Korea suspended trade relations with Japan effective June 15, 1959. Since approximately 64 percent of Korea's exports of marine products in 1958 went to Japan, this move was particularly distressing to the fishing industry. Following the trade suspension there was speculation about the establishment of a three-way trade arrangement--between Japan and Korea through the Ryukyus--but there have been no developments along this line.

In the latter part of July the Fresh Fish Exporters Association requested the Korean Ministry of Commerce and Industry to allow the exportation of fresh fish to Japan, pointing out that the export to areas other than Japan was "impossible" and that certain fishermen were being hard hit by the suspension. According to the Association, unfilled contracts for \$1 million worth of Korean fresh fish had already been signed with the Japanese.

Government Policy and Program for Fisheries Industry: The fishery industry of Korea is of traditional importance as the nation's chief source of animal protein and an important source of foreign exchange earnings. The industry has been hampered however by the destruction suffered in World War II and, particularly, in the Korean War; antiquated equipment and outdated, inefficient fishing techniques; lack of financing and credit systems for operations and investment; undeveloped marketing, processing and distribution systems for fisheries products; excessive taxes, charges, and other costs; and, a lack of technical staff.

Since 1953 progress in the development of the industry has been encouraging. This progress has been made possible largely by the aid provided by the United Nations and the United States in support of the Korean program for rehabilitation and expansion of the fishing industry. This aid has taken the form of boat construction, conversion, and repair; the introduction and demonstration of improved gear and fishing techniques; the construction of better marketing facilities; training in sanitation and the handling and freezing of products; the training of fishermen and technicians; the exploration of fishing resources; and, the establishment of a revolving loan fund for financing seasonal operations of the local guilds and individual fishermen. As a result of these activities, production from Korean coastal and offshore fisheries rose from an annual average yield of 293,000 tons for 1945-54 to 341,000 tons in 1956 and 403,158 tons in 1957. Discounting the slight drop in 1958 from the previous year, there has been a steady increase in production since 1953.

Faced with the increasing food demands of a growing population and the desire to increase ex-

ports of marine products, the Government has established a policy aimed at protecting fishing resources, increased production at lower costs, and expansion of foreign markets. Resources are to be guarded by means of better management and strict control over fishing operations in territorial waters. Further exploratory work is to be carried out to locate fish resources. The design and construction of fishing vessels are to be modernized and the use of improved gear encouraged. Available financial assistance will be increased and loan procedures simplified. Exports are to be encouraged by the establishment of quality standards backed by inspection and enforcement procedures. The advice and assistance of the U. S. Operations Mission is being utilized in the achievement of these goals.

The Government continues to assist in the expansion of production from aquiculture and is assisting in the development of inland fishery resources.

While progress toward the established goals is being made, the rate of advance is restricted by limited financial means.



Liberia

FISHERIES TRENDS, OCTOBER 1959:

A Liberian fishing company now operates six fishing vessels, and is in process of expanding operations to Sierra Leone and Nigeria. It is understood that a branch office is being opened in Freetown, Sierra Leone, and that two of the six vessels will contribute to supplying fish to that outlet. Operations of another firm in which the company has an interest are also reported to be progressing in Nigeria.

Interest in the fish pond program, sponsored by the U. S. International Cooperation Administration and the Liberian Department of Agriculture and Commerce, which is designed to make freshwater fish available to supplement the Liberian natives' protein-deficient diet, is slowly increasing. Requests for assistance in construction of fish ponds are being received in larger numbers, and several new fish ponds are currently under construction (United States Embassy in Liberia, October 9, 1959).



Martinique

IMPORTS OF FISHERY PRODUCTS UNDER LICENSE INCLUDED IN 1959 DOLLAR CREDITS:

In 1959, import allotment figures for dollar and sterling credits were increased from US\$3,640,000 (both dollar and sterling) available in 1958 to US\$5,125,408. For 1959, the dollar and sterling allotments were lumped into one sum, which can be used to buy either from dollar or sterling zones. Included in the listings of licensed importations is 58 million francs (US\$118,400) for fresh, salted, or canned fish. (United States Consulate dispatch from Martinique dated October 19, 1959.)



Mexico

CANNED FISH PACK, 1958:

The 25 Mexican canneries, reported to have operated entirely or in part on fishery products in 1958, packed an estimated 686,000 cases, or about 255,000 cases more than during 1957. The greatest increase was in the pack of California sardines which jumped from an estimated 155,000 to 334,000 cases. Canned shrimp, tuna, and mullet also showed significant increases. The total pack was estimated to have a value of 112,700,000 pesos (US\$9,016,000). Canned sardines, shrimp, abalone, and tuna and tunalike fish comprised about 93 percent of the value of the canned fishery products.

F 11 4 14 1 4 0 17 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1							
Table 1 - Mexico's Canned Fishery Products Pack, 1957-58							
Product		Quantity					
Todaet	1958	1957	1958				
			US\$				
Sardines		es)	1,000				
(15-oz. 48 cans/cs.)	334,000	155,000	3,504				
Abalone							
(16-oz. 48 cans/cs.)	106,000	105,000	2,072				
Shrimp (about							
11.1-oz. 48 cans/cs.)	96,000	60,000	1,904				
Tuna & tunalike fish							
(7-oz. 48 cans/cs.)	2/80,000	12,500	904_				
Mullet (about							
11.1-oz. 48 cans/cs.)	30,000	10,000	216				
Mackerel							
(16-oz. 48 cans/cs.)	25,000	70,000	208				
Miscellaneous 1/	15,000	18,000	208_				
Total cases							
1/ Includes miscellaneous fish and shellfish, turtle meat,							
and specialty items.							
2/ Includes an estimated 30,000 cases of yellowtail.							

During part of the year Mexican canned sardines were exported to the United States. The canned abalone market, mostly export, remained soft which discouraged any expansion in that fishery. There was a slight reduction in the number of operating plants owing to purchase and consolidation.

Normally, with the exception of abalone, canned fishery products are for local consumption. In 1958 as in 1957, however, some sardines were canned for export to the United States. (It is understood that this was done on a barter arrangement in part payment for fishing vessels secured by a cannery in Mexico from one in the United States.)

Of the 25 canneries that were reported to have processed sea food during 1958 more than half (13) were located in Baja California. Sinaloa ranked next with 5 and Veracruz followed with 2. The remainder were scattered about the Republic, along the coast, and on the central plateau. Nineteen of the canneries were on the West Coast, 3 on the East Coast, and 3 in the center of the country. Some were dedicated exclusively to fishery products while others, principally those in the highlands, worked only parttime on sea foods.

The more important species canned in Mexico are: California sardines (Sardinops caerulea), Pacific mackerel (Pneumatophorus diego), jack mackerel (Trachurus symmetricus), yellowfin tuna (Neothunnus macropterus), skipjack tuna (Katsuwonus pelamis), yellowtail (Seriola dorsalis), mullet (several species of Mugil), Spanish mackerel (several species of Scomberomorus), abalone (3 species of Haliotis), and shrimp (4 species of Penaeus).

The 1958 California sardine pack ranked first in quantity and in value. It was more than double the quantity canned in 1957. Fish were more readily available in 1958 and the plants obtained better fishing equipment. January was a good month but then fish became scarce until July. About two-thirds of the pack was made during the last half of the year. The type of pack depends primarily on the packer's estimate of demand. In

Mexico (Contd.):

1958 about 72 percent of the pack was one-pound ovals in tomato sauce. This was a considerable increase over the 1957 pack. Likewise, there was an increase in the percentage of one-pound natural pack, but the 6-ounce natural cylindrical can declined appreciably.

Foreign Trade: Imports of all fishery products by Mexico during 1958 were valued at about \$588,000 with European sardines accounting for about 70 percent of the value of imports. The United States share of the fishery imports was less than 5 percent and amounted to only about \$27,000.

Exports of canned fishery products were valued at about \$1,887,000. Practically all, 99.9 percent by value, of the 1958 exports were shipped to the United States. Abalone accounted for about 92 percent of the value of Mexican canned fishery products exports. (United States Embassy dispatch from Mexico dated October 10, 1959.)

Note: Values converted at rate of 12.50 pesos = US\$1.

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CUBAN FISHING VESSELS BARRED FROM PORT OF ISLA MUJERES:

The Commander of the Isla Mujeres, Quintana Roo Naval Base and former Chief of Staff of the Mexican Navy, has announced that Cuban fishing vessels will no longer be permitted free use of that port. Only vessels entering under protest resulting from bad weather, damage to the vessels, or illness of the crew will be allowed entry.

For many years Cuban fishing boats have entered Isla Mujeres for shelter and for supplies. These boats fish principally for groupers and snappers which they discharge in Cuba. Some are fitted with extensive live-wells while others follow the conventional pattern of preserving the fish in ice (United States Embassy in Mexico City, October 6, 1959.)

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ENSENADA AREA FISHERY TRENDS, SEPTEMBER 1959:

The abalone landings in the Ensenada, Mexico, area through August this year have been normal but, according to the Fisheries Inspector's Office, the tuna catch was 30 percent below normal, not because of lack of fish, but because of the poor market. The prices offered for tuna in the United States have dropped drastically. The only firm in Ensenada, reported to be engaged in tuna canning as an industry, has had to cut the pay of its fishermen.

The spiny lobster season opened on October 1 and continues until March 15, 1960. The Regional Federation of Fishing Cooperatives, consisting of 10 fishing cooperatives in Ensenada, now will sell spiny lobsters through the bank to a United States firm for 50 cents a pound in contrast to the previous 45.5 cents a pound which it has received for the last 5 years from another firm. The money paid by the purchaser will go to the bank to pay off a debt of approximately 9 million pesos (about US\$720,000) which the cooperatives owe for a loan made in the past for purchase of equipment.

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EXPORT DUTY ON FISH MEAL LOWERED:

Effective October 23, 1959, the Mexican export duty on fish meal will be onethird less than previously. The new export duty will amount to about US\$8.16 per gross metric ton, which is about US\$4.08 under the previous rate. The change in rate was effected by decreasing the ad valorem from 30 percent to 20 percent. The official price, upon which the ad valorem is calculated, remains the same at 0.50 pesos per gross kilogram (about US\$40 per metric ton).

Most of Mexico's fish meal production comes from the Peninsula of Baja California. The 1958 production of fish meal was about 2,735 metric tons of which less than ten percent (216 tons) was exportedall to the United States. It is not expected that the new duty will increase appreciably the exports of fish meal because Mexico is deficient in this commodity. Imports of fish meal in 1958 a-

Mexico (Contd.):

mounted to 3,621 metric tons, states a United States Embassy dispatch (October 20, 1959) from Mexico.

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SHRIMP FISHERY TRENDS, SEPTEMBER 1959:

The Mexican northwest Pacific Coast shrimp season opened on September 16 after two months' closure. The Guaymas fleet set sail on this date, but the Mazatlan vessels, owing to small size of shrimp and cooperative disputes, did not begin fishing until some 10 to 12 days later. The Guaymas landings were very good with many vessels reporting 4-6 tons of shrimp tails per trip. Landings flooded the Guaymas freezers and surplus fresh shrimp were trucked to Mazatlan for processing. First reports from Mazatlan indicated good catches there also. Bay fishing, however, was reported as spotty. This suggests the possibility of a decline in catches later on. Normally, bay catches should be running high at this time of year.

In the Gulf of Mexico, near Tampico, two Texas shrimp vessels were seized late in September by Mexican patrol boats. Vessels and crews were released upon posting cash bonds of 20,000 pesos in one instance and 25,000 pesos in the other (about US\$1,600 and 2,000 respectively). The catch and fishing gear were condemned. These two seizures and one in late August are the first in about three years.

The Carmen-Campeche September catches in the Gulf of Mexico were about the same as August with Carmen landings averaging slightly under one ton of headless shrimp per trip and Campeche landings about 1,500 pounds per trip. The September landings in both Carmen and Campeche showed an increase in the proportion of brown shrimp over August. Pink shrimp still remained the dominating species in both ports. Shrimp sizes increased somewhat during the month. About 75 percent of the Campeche and 50 percent of the Carmenlandings ran 26 to 30 count per pound or under. The sizes tended to increase as September progressed, according to an

October 2, 1959, dispatch from the United States Embassy in Mexico City.



Netherlands

INCREASE IN WHALE PRODUCTION PLANNED:

The Dutch whaling fleet, owned by the Netherlands Whaling Company of Amsterdam, is expected to try for a record catch during the coming season. The fleet departed for Antarctic whaling grounds on November 1, 1959. Since the company is no longer bound by the rules established by the 1946 International Whaling Convention, from which Holland together with Norway withdrew on June 30, 1959, it has reportedly fixed its own limit at 1,200 blue-whale units. This means a production target of approximately 24,000 metric tons of whale oil for 1959 as compared with 18,800 tons produced from the 1958 catch of 969 units. In order to supply fuel oil and transport the whale oil, two tankers were added to the fleet, which consists of the 26,830-ton whaling ship Willem Barendsz and 13 catchers. The fleet, which expects to start operations in the Antarctic in mid-December, will operate 107 days instead of 69 days as in previous seasons. In contrast to previous seasons, no specific effort will be made to catch sperm whales.

The Willem Barendsz carries a new freezing plant which will enable it to fulfill its contract with a United Kingdom firm to furnish 1,500 tons of frozen whale meat a year.

For several years the Dutch biologists have argued that the supply of blue whales in the Antarctic is larger than generally supposed, and the Dutch have argued for an increased limit. The Netherlands has demanded a quota of 8 percent of the total catch, but other countries have insisted on a quota of 4.6 percent for the Dutch.

According to the Dutch, six Japanese whaling fleets will join Antarctic whaling operations in November, with a target of 5,040 blue-whale units. Britain will send three whaling fleets which are expected

Netherlands (Contd.):

to catch 2,500 blue-whale units. Norway (with 8 fleets) had demanded a 33-percent share of the 15,000 units, or 5,000 units, and it has announced its intention of increasing that catch by some 800 units. The Dutch expect Soviet Russia to abide by its original share of 3,000 units. The Russian whaling fleet, headed by the new 36,000-ton mothership Sovetskaya Ukraine, left Odessa in mid October, according to a Russian news bulletin.

One difficulty has arisen in connection with the signing-on of the crew for the Willem Barendsz. During a meeting on October 21 at the Center for Seamen of the Merchant Marine and the Fishing Fleet, the Center's chairman advised personnel of the whaling fleet not to sign their contracts with the Netherlands Whaling Company pending approval of the contracts by the Netherlands Government Board of Mediators. In April of this year the Center had agreed to a request received from the Company to negotiate for changes in the labor agreements with the company's workers, if the Netherlands were allotted less than 1,200 blue-whale units by the International Whaling Convention. The Center has believed that there is no reason to alter the labor conditions now that the Netherlands has withdrawn from the Convention and has fixed its catch limit at 1,200 units. The chairman stated that notwithstanding this fact the Company now wants to reduce the earnings of its personnel by about ten percent. As a result of these negotiations it may be possible that the Willem Barendsz may be delayed in sailing from Amsterdam.

The Willem Barendsz has many provisions for the comfort, safety, and welfare of the 500-man crew during the long six months Antarctic voyage. The ship has a modern 12-bed hospital and operating room. The wife of the ship's doctor, who accompanies her husband, conducts regular church services and performs other chaplain duties. Current entertainment films are available for frequent showings and a well-stocked library supplies adequate reading material to suit the taste of the men. Liv-

ing quarters of the ship are attractively decorated featuring paintings and photos reminiscent of Holland. (The United States Embassy in The Hague, October 20, 1959, and United States Consul in Amsterdam, October 23, 1959.)



New Zealand

RESTRICTIONS REMOVED ON SOME IMPORTS FROM THE UNITED STATES:

For the first time in the postwar period, most discriminatory restrictions on imports from dollar sources have been removed, opening the New Zealand market in 1960 to dollar goods on an equal basis for all products except motor vehicles and timber. United States firms will now be able to compete on more equal terms with other suppliers.

New Zealand's exports to the United States have about doubled in the last two years and resulted in a substantial surplus in New Zealand's balance of payments with the United States. The current liberalization of trade with the dollar area will probably result in an expansion of imports from the United States. Among the items granted increases in quotas are canned and preserved fish, according to a United States Embassy dispatch (October 9, 1959) from Wellington.

Nigeria

SURVEY OF TUNA STOCKS BY UNITED STATES COMPANY PROPOSED:

The West African program of the Rockefeller Brothers Fund includes a plan to arrange for a detailed survey of the tuna stocks in the Atlantic Ocean off the Nigerian coast by a United States tuna cannery company. Such a survey would necessarily include a study of the availability of bait nearer the shore. According to reports, the United States company has already agreed with the Ghanaian Government to conduct a survey off Ghana. Extension of the area to be surveyed to Nigeria would be relatively

Nigeria (Contd.):

in expensive. (United States Consul in Lagos, September 1959.)



Norway

FISHERIES TRENDS, SEPTEMBER 1959:

A total of 1,013,000 metric tons of fish was landed in the period from January 1 to September 19, 1959, as compared with 969,000 and 1,395,000 metric tons during the same periods of 1958 and 1957, respectively. The fish-processing industry, particularly filleting and freezing companies, became increasingly concerned over the small quantity of fresh fish supplies in relation to production capacity. According to a Government source, the industry is considering the acquisition of additional fishing vessels and equipment. Norway's participation in the Iceland herring fishery is growing, and the industry is being encouraged by the Government to fish for more herring in the North Sea.

The long-standing dispute over "exvessel" prices of fish between Norges Raafisklag, the fishermen's marketing organization in North Norway, and Norsk Frossenfisk A/L, the principal purchaser of fresh fish for filleting and freezing, has been settled -- at least for the time being. Norges Raafisklag agreed to comply with the directives of the Government on prices of fish for filleting and freezing and also honored the terms of the agreement it had with Norsk Frossenfisk A/L concerning the price of fish delivered during the summer months. (United States Embassy report from Oslo dated October 20, 1959.)

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QUOTA FOR 1959/60 WHALING SEASON ESTABLISHED:

According to press reports from Sandefjord, the headquarters of Norway's whaling industry, the whaling quota for the 1959/60 Antarctic whaling season will be 5,800 blue-whale units, which is

equivalent to the 1958/59 season's catch. The Government has not yet formally established the quota, but it is believed that the quota will undoubtedly be set at that figure.

The whaling industry has reportedly reached an agreement under which eight expeditions will participate in the 1959/60 Antarctic season, or one less than last year. The six large expeditions will be allocated a quota of 705 blue-whale units each, and the two smaller expeditions, 585 units each. An unallocated balance of 400 blue-whale units will be distributed during the course of the season. The large expeditions will operate with a maximum of nine catchers and the smaller expeditions with eight catchers. The Norwegian whaling fleet was due to depart for the Antarctic during the latter part of October and the early part of November.

Pakistan

MAIN FEATURES OF THE NEW FISH HARBOR COMPLETED:

The main features of the new fish harbor at Karachi, Pakistan, were completed by the end of September 1959. With the completion of the jetty and the fish market it was possible to hold a formal inauguration on October 2. Full utilization of the new facilities will not be possible, however, until (1) dredging operations are completed to permit use of the dock at low tide; and (2) the Karachi Fishermen's Cooperative Society, which has been entrusted with the operation of the harbor, obtains the necessary auctioneers, accountants, and other administrative personnel.



Peru

EXPORTS AND IMPORTS OF MARINE-ANIMAL OILS, 1957 AND 1958:

Peru's foreign trade in marine-animal oils is largely confined to exports of oils derived from the whaling and the fishery for sardine-like fishes for reduction into fish meal and oil.

Peru (Contd.):

In 1957 close to 8,828 metric tons of marine oils were exported to western Europe and the United States. The United States was Peru's best customer for sperm oil--about 2,742 tons or 61.8 percent out of the total exports of 4,435 tons in 1957.

Table 1 – Peru's Exports of Marine–Animal Oils by Country of Destination 1957 and Total 1958						
Commodity and Country of Destination	1957	19581/				
	(Metric	Tons)				
Whale oil, refined: United States	55.5					
Total	55.5					
Sperm oil: United States	2,741.9	-				
Germany	1,050.0	-				
Netherlands	643.5					
Total	4,435.4	7,352,2				
Fish oil: Netherlands	2,245.6	-				
Germany	1, 165.0	-				
Norway	586.0	-				
Italy	200.8	-				
Sweden	112.1	-				
Belgium	28.0					
Total, 4,337.5 1,643.3						
1/Estimates; breakdown by country of destination unavail-						
able.						

Imports of marine oils by Peru in both 1957 and 1958 were nearly all cod-liver oil from Norway. Small quantities of refined whale oil, fish oil, and cod-liver oil were imported from the United States in 1957.

Table 2 - Peru's Imports of Marine-Animal Oils by Country of Origin 1957 and Total 1958					
Commodity and Country of Origin	1957	19581/			
	(Metric	Tons)			
Whale oil, refined:		1			
United States	4.1	-			
Total	4,1	5,6			
Cod-liver oil:					
United States	1.8	- i			
Norway	135.4	<u>.</u> .			
Other	1.7	2/			
Total	138.9	86,9			
Fish oil:					
United States	2.3				
Total	2.3	-			
1/Estimates; breakdown by country of destination unavail-					
able.					
2/Includes 9.0 tons of fish-liver oil.					

Duties assessed by Peru on imports of marine oils are divided into specific duties per gross kilo, ad-valorem duties on c.i.f. value, and percentage charges over ocean freight.

Peru's production of sperm oil in 1957 recovered slightly and totaled 4,491 tons, about 5 percent more than in 1956.

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EXPORTS OF MARINE PRODUCTS, JANUARY-JUNE 1959:

Exports of principal marine products by Peru, January-June 1959, amounted to 153,975 metric tons (valued at US\$20.2

Peruvian Exports of Principal Marine Products,						
January - June 1959						
Marine	2nd, Quarter 1959			First Half 1959		
Products	Qty.	Value1/		Qty	Value2/	
	Metric	Million	US\$	Metric	Million	US\$
	Tons	Soles	1,000	Tons	Soles	1,000
Fish meal	72,522	234.0	8,439	123,580	390.7	14, 524
Fish, frozen,	,		` ;			
canned, etc.	11, 430	66.8	2,409	17, 208	116.4	4, 327
Fish oil	5,625	13.5	487	6,926		62 8
Sperm oil	282		32	4,031	13.6	
Whale meal.	827	2.3	83	1,825	5.4	201
Fertilizer						
(Guano)				405	1.0	37
Total	90,686	317.5	11,450	153,975	544.0	20, 223

1/F.o.b. values converted at rate of 27.73 soles equal US\$1 for 2nd quarter of 1959.
2/F.o.b. values converted at rate of 26.99 soles equal US\$1 for first half of 1959.

million). Exports for the first six months of this year amounted to 95.2 percent of the 1958 annual total of about 161,658 tons. Fish meal exports continued to expand, with the January-June 1959 exports of 123,580 tons exceeding the 12-months 1958 total (105,777 tons) by 16.8 percent.

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FISHERIES PRODUCTION EXPANDS RAPIDLY:

The rapid development of Peru's fisheries resources was brought to world attention in September when at the First

	Table 3 - Peruvian Duties on Imported Marine Oils in Effect 1958					
Tariff No.	Item No.	Commodity	Specific Soles per Gross Kq.	US¢	Ad-Valorem (Percentage c.i.f. Value)	Percent Over Ocean Freight Charges
96 96 96 96 96	365 366 367 368 369	Whale oil, refined	0.60 0.375 free " 2.25	Per Kq. 2.19 1.37 - 8.21	15.667 15.667 13.667 13.667	2 2 2 2 2

Peru (Contd.):

International Oceanography Congress held in New York City it was announced that Peru had jumped from 26th to 5th place among fish-producing countries of the world in the short period of three years. The poor Norwegian herring catches in 1957 and 1958 were a factor in this expansion because Peru, with its abundance of marine life, was in a position to fill the shortages thus created. Great strides continue to be made in the Peruvian industry. Exports of principal fish and fish products were valued at US\$20.7 million in 1958 and in the first half of 1959 were valued at just about the same amount (\$20.1 million).

Peruvian Exports of Principal Fish and Fish Products, January-June 1958-59

Januar	v-June		
	January-June		
1959	1958		
(Metric Tons).			
7,727	5,849		
123,580	49,803		
7,210	3,674		
1,643	983		
4,031	4,275		
6,926	1,050		
	(Metri 7,727 123,580 7,210 1,643 4,031		

The principal product exported in both quantity and value in 1958 and the first half of 1959 was fish meal, which made up 80 percent of the volume and 72 percent of the value in the latter period.

The expanding fishing industry has prompted at least three port cities to consider it a possible source of revenue through taxation. Peruvian Senate support is forecast for a S/10 to S/20 (about 36 and 71 U. S. cents) per ton tax on fish meal processed in Callao for export. A 6-percent tax on fish meal and fish oil processed in Chimbote and Casma (9 percent for plants not processing fish oil) is proposed by a bill presented in the Chamber of Deputies.

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RESTRICTIONS ON FISH MEAL PLANT EXPANSION MODIFIED:

The Government of Peru has issued a decree (October 9, 1959) abolishing its general restriction on the establishment of additional fish meal plants. It was concluded that the large catches of fish for existing plants had not reduced the supply of fish in the waters off the Peruvian coast.

The new decree provides for the establishment of certain closed seasons by the Ministry of Agriculture and designates three major zones where no additional plants may be established nor expansion of existing plants permitted.



Portugal

CANNED FISH EXPORTS, JANUARY-JUNE 1959:

Portugal's exports of canned fish during January-June 1959, amounted to 32,626 metric tons (1,798,000 cases), valued at US\$16.5 million as compared with 26,959 tons, valued at US\$14.6 million for the same period in 1958. Sardines in olive oil exported during the first six months of 1959 amounted to 23,821 tons, valued at US\$11.6 million.

Portuguese Canned Fish Exports,				
January-June 1959				
Species	JanJune 1959			
	Metric	US\$		
	Tons	1,000		
Sardines in olive oil	23,821	11,582		
Sardine & sardine-				
like fish in brine	998	200		
Tuna & tunalike fish				
in olive oil	1,183	836		
Anchovy fillets	3,296	2,301		
Mackerel in olive oil .	2,032	1,004		
Other fish	1,296	625		
Total	32,626	16,548		

During January-June 1959, the leading canned fish buyer was Germany with 7,457 tons (valued at US\$3.7 million), followed by Italy with 4,132 tons (valued at US\$2.2 million), Great Britain with 2,963 tons (valued at US\$1.4 million), United States with 2,857 tons (valued at US\$2.0 million), and Belgium-Luxembourg with 2,305 tons (valued at US\$1.1 million). Exports to the United States included 1,426 tons of anchovies, 104 tons of tuna, 1,242 tons of sardines, and 28 tons of mackerel. (Conservas de Peixe, August 1959.)

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CANNED FISH PACK, JANUARY-JUNE 1959:

The total pack of canned fish for January-June 1959 amounted to 12,325 metric

Portugal (Contd.):

tons as compared with 12,619 tons for the same period in 1958. Canned sardines in oil (5,200 tons) accounted for

Portuguese Canned Fish Pack, January-June 1959			
Product	Net Weight	Cases	
	Metric	1 000	
In Olive Oil: Sardines	Tons 5,200	1,000 273	
Sardinelike fish	468	24	
Anchovy fillets	3,257 2,691	325 96	
Mackerel	185	7	
Other species	524	27	
Total	12, 325	752	
Note: Values unavailable.			

42.2 percent of the January-June 1959 total pack, down by 23.7 percent from the pack of 6,818 tons for the same period of 1958, the August 1959 Conservas de Peixe reports.

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FISHERIES TRENDS, JANUARY-JUNE 1959:

Sardine Fishing: During January-June 1959, the Portuguese fishing fleet landed 17,087 metric tons of sardines (valued at US\$1,695,582 ex-vessel or about \$99.23 a ton).

June 1959 landings of sardines totaled 6,279 tons valued at US\$617,948. Canneries purchased 34.5 percent or 2,164 tons of the sardines (valued at US\$222,609 ex-vessel or about \$102.87 a ton) during June 1959. A total of 4,114 tons was purchased for the fresh fish market, and 1 ton was salted.

Other Fishing: The January-June 1959 landings of fish other than sardines were principally 12,476 tons of chinchards (value US\$788,069) and 1,076 tons of anchovies (value US\$104,835). (Conservas de Peixe, August 1959.)

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EXPORTS OF CANNED SARDINES TO ALL DESTINATIONS AND TO WEST GERMANY, 1954-58:

Portugal's exports of all packs of canned sardines (exclusive of sardine-like fish) to West Germany in 1958 amounted to 11,783 metric tons, or 23.9

percent out of a total of 49,229 tons exported to all destinations.

	Table 1 - Portuguese Exports of Canned Sardines 1/ to All Destinations and to West Germany, 1954-58				
Years	Total Exports		West Germany		
1 0000	Quantity	Value	Quantity	Value	
	Metric	US\$	Metric	US\$	
	Tons	1,000	Tons	1,000	
1958	49, 299	25,480	11,782	6,242	
1957	40,027	23, 493	7,939	4,674	
1956	47, 167	27,234	8, 827	5,079	
1955	51,502	25, 209	12,564	6,150	
1954	42,411	21,613	9,491	4,843	
1/Inclu	1/Includes all sardine packs but not sardinelike fish such as				
anchovies.					
Source	Source: Commercio Externo, 1954-58.				

West Germany in 1954-1958 increased its imports of boneless and skinless sardines, and is taking a larger share of whole sardines in olive oil. On the other hand, imports of sardines in sauces other than olive oil decreased during those years. (United States Consulate in Oberto, July 17, 1959.)

Table 2 - Portuguese Exports of Canned Sardines by Type of Pack to All Destinations and to West Germany, 1954-58 Total Exports West Germany Years Quantity | Value Quantity Value Metric US\$ Metric Skinless and Tons 1,000 Tons 1,000 boneless: 1,430 1958 5,035 3,859 1,890 1957 1, 104 4,245 3,464 877 4,091 1956 2,612 968 619 1955 706 4,281 2,084 346 1954.. 3,332 1,699 629 Whole sardines in olive oil: 4,245 1958 33,603 16,398 8,734 5, 123 5, 677 2,864 3,213 1957 24, 894 31, 591 13,919 1956 18,098 4,580 1955 9,355 16,506 33,678 1954 . . 27,805 5,869 2,997 14, 163 Whole sardines <u>in sauces (other</u> than olive oil): 1958 10,662 5,223 1,158 567 10,887 11,484 6,109 6,524 1,712 2,183 1957 933 1,246 1956 1,224 1955 2,503 13,543 6,618 11,275 5,751 ,993 527 1954 Note: Values converted at rate of 28.75 contos = US\$1.

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COD-FISHING FLEET HAS POOR SEASON:

Source: Commercio Externo, 1954-58.

The 48 Portuguese cod line-fishing vessels turned to the Newfoundland Banks fishing areas (late in September) after spending some days in port due to hurricane warnings. The fleet at that time was short of a full catch by about 17,000

Portugal (Contd.):

metric tons of fish and reflected the general shortage of cod on the Newfoundland and Greenland banks. The poor catch was of great concern to the Cod Fishing Shipowners Guild in view of the relatively poor catch in 1958.

Late in October the cod-fishing fleet continued to find fishing poor and bad weather aggravated the situation. The Guild announced that due to the poor weather conditions the fleet expected to return to Portugal. Very few of the vessels reported satisfactory catches.

Due to the poor catch this season, and the anticipated short supply of salt cod in future months, some instances of sales above the legal maximum prices were reported, state United States Embassy dispatches from Lisbon dated October 8 and 22, 1959.

* * * * *

EMBARGO ON EXPORT OF ALGAE (SEAWEED) LIFTED FOR SINGLE SHIPMENT:

A late summer shipment of 100 metric tons of gelidium (algae used for manufacture of agar-agar) to Japan was permitted by the Portuguese export licensing agency in spite of an embargo on the export of this product.

The Portuguese exporter had justified application for an export license on the grounds that he had that quantity of gelidium immediately available for export and that the Japanese customer was willing to make purchases of similar quantities every year. The Under-Secretary of State for Commerce accordingly ruled (1) that this particular shipment be authorized on an exceptional basis and (2) that a study be undertaken to determine the supplies of gelidium and/or agar-bearing seaweed in Continental Portugal.

Studies have already been completed on supplies of agar-bearing seaweed available in Madeira, Azores, and Cape Verde Islands, but the results have not yet been announced. However, it is understood that results were favorable in Madeira and the Azores and unfavorable in Cape Verde Islands. This may mean some exports of agar-bearing seaweed from Madeira and the Azores may ultimately be permitted.

FUNDS PROVIDED BY GOVERNMENT FOR FINANCING FISHING INDUSTRY PROJECTS:

A Government decree of importance to the fishing industry was published September 21, 1959. Decree-Law No. 42,518 extends the validity of the "Fund for the Renovation and Re-Equipment of the Fishing Industry" and authorizes that Fund to borrow up to 300 million escudos (US\$10.5 million) for the financing of projects for the industry included in the Second Six-Year Development Plan.

Neither decree specifies what projects are to be undertaken. However, the Government contribution to the financing of plans for the fishing industry (75 percent of the funds needed) was estimated at 550 million escudos (US\$19.25 million), hence the major portion of the Government financing for the fisheries under the Second Planis provided for by this decree. (United States Embassy dispatch from Lisbon, dated October 1, 1959.)

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PROPOSED BARTER DEAL WITH GREECE INCLUDES FISHING VESSELS:

Two directors of a Portuguese tobacco company have visited Greece for preliminary discussions with Greek authorities with a view to signing a barter agreement. The proposed deal, which has not yet been concluded, would involve the exchange of 5,000 tons of Greek tobacco, worth approximately US\$7 million, against delivery to Greece of four fishing vessels to be constructed in a Lisbon shipyard. The proposed vessels are to be equipped with installations for the production of oil and fish meal, according to a September 17, 1959, dispatch from the United States Embassy in Lisbon.



Sweden

EXPORTS OF FISHERY PRODUCTS TO EAST GERMANY STOPPED:

Exports of Swedish west and south coast fishery products to East Germany by the Swedish organizations in Goteborg and Karlskrona have ceased because of Sweden's failure to bring in fodder products, brown coal, and grain from East Germany.

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Sweden (Contd.):

Exports to and imports from East Germany are specified in the global compensation arrangement for 1959 governing all trade between Sweden and East Germany.

The halt in exports has resulted in difficulties for the two fishing organizations which have been forced to store large quantities of herring. It is estimated that about 4,500 metric tons of herring at present are stored in freezing plants in southern and western Sweden.

About three-quarters of the quantity of herring contracted by East Germany is still not delivered and no mackerel has been exported, in spite of the fact that it was provided for in the contract.

Export shipments to East Germany have stopped at a time when Swedish herring fishing is of considerable volume. The West Coast Fishermen's Central Organization in order to reduce the landings of herring has further limited the quantity of herring that may be landed by each fisherman from 50 boxes per man per trip to 50 boxes per man per week.

The new limitations do not apply on landings inforeign ports and it is therefore hoped that the larger boats will prefer to land their fish in foreign ports.

It is hoped that the fish trade with East Germany will commence again shortly, and in that case Sweden should be able to deliver the total quantity stored at one time. (United States Embassy dispatch from Goteborg, dated October 6, 1959.)

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ONE SMALL CANNER STOPS PACKING FISH:

On a bout October 17, 1959, a small Swedish fish-canning plant located on the Swedish coastal island of Bohus-Malmon was expected to cease the production of canned fish products prepared from sprat, mackerel, and North Sea herring. The closure was caused mainly by the shortage of sprat, the most important raw material of the plant. The irregularity in the supply of other types of fish also played a part in the decision to close the plant.

Under the conditions, the manufacturer claimed that it was impossible to operate the plant satisfactorily at full production capacity.



Turkey

LANDINGS OF AQUATIC PRODUCTS, 1958:

The landings of fish, shellfish, and other aquatic products in Turkey amounted to about 175.8 million pounds. Principal

Turkey's Landings of Aquatic Products, 1958				
Products	1,000 Lbs.			
Salt-water:				
Anchovy	20,776			
Sardines	6,713			
Flatfish	6,510			
Bonito	46,075			
Mackerel.	4,462			
Horse mackerel (bluefin tuna)	10,754			
Tuna	920			
Sharks and rays	1,287			
Unclassified salt-water,	29,845			
Total salt-water	127,342			
Fresh-water:				
Unclassified	34,220			
Shellfish:				
Lobster	650			
Mollusks	137			
Total shellfish	787			
Other:				
Dolphin	13, 228			
Sponges	213			
Total	175,790			

products were: bonito, 46.1 million pounds; anchovies, 20.8 million pounds; freshwater varieties, 34.2 million pounds; and dolphin, 13.2 million pounds.



Uganda

FRENCH EXPERT TO SURVEY POND FISHERIES:

The Director of the Le Paraclet Hydrobiological Station of the Ministry of Agriculture, France, arrived in Uganda in mid-1959 to advise the Government on increasing the production and expanding the use of fish ponds.

He has taken up the assigment on behalf of the Food and Agriculture Organization (FAO), Rome, Italy, in response to a request by the Government of Uganda.

"Pond fisheries provide one of the most effective ways of increasing animal

Uganda (Contd.):

protein in the human diet," the expert stated in an interview at FAO headquarters before leaving for Uganda. "A well-managed pond can yield about two to three tons of fish per hectare (2,471 acres) per year and, as you know, fish is a rich natural source of protein. It has about the same protein content as fresh meat.

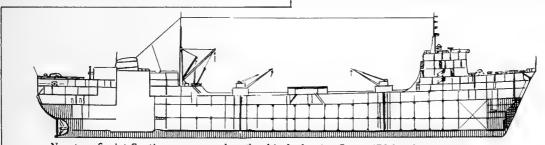
"There are already about 2,000 fishponds in Uganda, ranging in size up to 10 hectares and I hope my work will assist in increasing the productivity of these ponds and lead to the building of more ponds in villages." plant is able to produce more than a ton of edible fish flour a day from pilchard and maasbanker (jack mackerel) meal. Nearly 1,000 tons had been supplied by July 1959 for the enrichment of bread in the western area of the Cape. (The South African Shipping News and Fishing Industry Review, July 1959.)



U.S.S.R.

NEW TYPE FLOATING CANNERY AND MOTHERSHIP FOR HERRING FLEET:

A new type 15,000-ton mothership for Soviet trawlers engaged in herring fish-



New type Soviet floating cannery and mothership for herring fleet--476 feet long; speed 14.5 knots.

The French pond fisheries expert will advise and assist the Government in "determining some of the basic factors affecting the biology of fish ponds and thereby their production of fish." He will also assist in other ways in the development of fish culture in Uganda. Part of his work will be to study methods of fertilization, the role that bottom deposits have in fish production, the sequence of plankton production, and pond management. Much of the French expert's work in Uganda will be based on the experimental fish farm which the Government has established near Kampala.



Union of South Africa

EDIBLE FISH FLOUR PRODUCED ON COMMERCIAL SCALE:

A plant at Dido Valley, Simonstown, Union of South Africa, is producing neutral fish flour for human consumption on an adequate commercial scale. The plant was developed by the South African Fishing Industry Research Institute in cooperation with the fish meal industry. The

ing serves as a combined floating canning plant, supply ship, and repair base. It is said to have a daily production capacity of 400 metric tons of finished and semifinished products. The hull is all welded and reinforced for ice conditions. A helicopter is used for locating herring shoals. A cinema, library, and reading room are provided for the crew. (United States Consulate dispatch from Goteborg, September 4, 1959.)

* * * * *

PLANS TO INCREASE FLEET OF LARGER FISHING VESSELS FIVEFOLD:

The twin-screw factoryship Sovietskaja Sachalin (9,300 gross tons) was launched in Gdansk, Poland, according to Dansk Fiskeritidende (September 17, 1959), a Danish fishery trade periodical. A sistership, Sovietskaja Litwa, was built and launched earlier in Poland for the Soviet Government.

At the same time the shipyard has delivered a third sistership, Sievierodvinsk, to the Soviets. Each vessel is 508 feet long, 66 feet in breadth, and has a depth of 27 feet. A steam engine of

U.S.S.R. (Contd.):

5,000 hp. gives the vessel a speed of 13 knots.

In this connection, the Russian telegraph bureau, Tass, states that the Soviet Union, within the framework of the current five-year plan, expects to quintuple its fishing fleet of larger vessels. By 1963 there will be built a number of factory trawlers, 279 feet in length, 3,500 gross tons, with an action radius of 60 to 80 days. The freezing capacity of the trawlers will be 30 metric tons of ocean fish each 24 hours.



United Kingdom

FISHING SUBSIDIES AND GRANTS REVISED FOR 1960/61:

The fishing industry was debated in the British House of Commons on July 14, 1959, when statutory instruments covering changes in the White Fish and Herring Industries Act, 1957, were approved, together with two further statutory instruments relating to grants which are made towards the construction of new vessels.

For the second year in succession the Government reduced the subsidy for steam trawlers payable by the White Fish Authority. The cut varies according to the size of the vessel from 5s. to 30s. (about US\$0.70-US\$4.20) per day. This represents an average reduction of about seven percent in the present subsidies. The Government claimed that at the existing rate of subsidy owners are finding it possible to keep a number of old coal-burning vessels running rather longer than is desirable. This is against the long-term interests of the fishing industry. The cut has been moderated by the fact that certain operating costs have risen and because it is considered dangerous to make too sharp a reduction in coal-burning trawlers at some ports which depend heavily on such vessels for their trade and where employment may be above the av-

At present there are at Grimsby five oil-fired steam vessels built since 1952. They have been built with the aid of grants and loans from the White Fish Authority. The Government announced last year that it intends such vessels to be treated for subsidy purposes in the same way as Diesel vessels of the same size, which receive no subsidy. Last year, the subsidy on the Grimsby vessels was reduced by half with the intention of eliminating it entirely this year. However, because such vessels have been less profitable in the year ended March 31, 1959, than hitherto, instead of eliminating the subsidy immediately the Government will reduce it by half next year.

The Government reduced from £6 10s, per day to £5 per day (US\$18.20 to US\$14.00) the subsidy for seine-net vessels over 70 feet in length, which normally make voyages of not more than seven days' duration. These vessels are all Scottish. The purpose of reducing the rate is to bring it into line with the rate which applies to motor trawlers of the same size and thus remove the anomaly of having different rates for similar vessels which compete with each other. With the introduction of new types of gear, these vessels of between 70-80 feet are engaging to an increasing extent in both trawling and seining. They can change from one method to the other very easily.

No changes are being made in the herring subsidy, which was instituted in 1957 to arrest the tendency for boats to switch from herring fishing to fishing for white fish. Last year, the profits and earnings in that section of the industry showed some improvement which the Government hopes will result in more boats participating in such fishing.

It is estimated that the total cost of the white fish and herring subsidies in the year beginning April 1, 1960, and ending March 31, 1961, will be about £2.75 million (US\$7.7 million) as compared with £3 million (US\$8.4 million) in the year ending March 31, 1960. It is estimated that by March 31, 1960, about £15.75 million (US\$44.1 million) of the £17 million (US\$47.6 million) authorized by the White Fish and Herring Industries Act, 1957, will have been spent, so that the unexpended balance will be insufficient for the needs of the following year. The Act provides that the limit of £17 million may be raised to £19 million (US\$53.2 million) with the approval of the House of Commons. This E2 million additional will not cover the industry's needs much beyond the end of the 1960/61 subsidy year, but the Government intends to introduce legislation in the next Parliamentary Session (normally commencing in November) to provide additional funds.

In the light of the Report of the Committee of Inquiry which is looking in detail into the whole question of the future of the fishing industry, the Government will decide whether financial assistance should be extended to the industry beyond the periods authorized by the 1957 Act.

Two further Statutory Instruments approved on July 14, 1959, relate to grants which are made towards the construction of new vessels. They increase the maximum grant which may be paid from £30,000 to £37,500 (US\$84,000-\$105,000) in the case of white fish vessels, and from £15,000 to £17,500 (US\$47,000-\$49,000) in the case of herring vessels. These increases are intended to coincide with the increases in building costs which have taken place since the ceilings were fixed in 1956 and to ensure that the same degree of assistance is given as when the grants were first introduced in 1953 (about 25 percent). (United States Embassy in London dispatch July 17, 1959.)



Uruguay

FISH MEAL PLANT DONATED BY UNITED NATIONS:

Uruguay's Servicio Oceanografico y de Pesca (Oceanographic and Fishery Service), a Government agency which has control of the fishing industry monopoly, received a donation of a fish meal plant from the United Nations. The fish meal plant will be installed at a cost of about US\$46,000 and the technical knowhow will be supplied by the Uruguayans.

Fish waste will be converted into fish meal to be added to feed for chickens and hogs. (Industrias Pesqueras, July 1, 1959, Vigo, Spain.)



Yugoslavia

JAPANESE TUNA VESSEL LANDS TRIP:
The Japanese tuna long-liner Banshu
Maru landed 1 250 metric tons of tuna at

Maru landed 1,250 metric tons of tuna at the Yugoslav port of Rijeka on October 9, 1959.

Following the discharge of the trip, the vessel was due to take out a group of Yugoslav fishermen on trips along the Adriatic coast for the purpose of demonstrating Japanese methods of tuna fishing.

The demonstration trips were made under an agreement with Japanese shipbuilders, who have contracted to build several tuna fishing vessels for Yugoslavia.

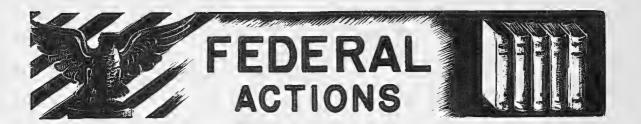


BUOYS MARK TRANSATLANTIC TELEPHONE CABLES

A bright, yellow, and red buoy may be seen bobbing in the Atlantic Ocean off the coast of North America and Europe this year and next. It marks an important "obstruction" to ships and fishermen. For in the vicinity of one of those buoys and stretching all the way to the mainland will be a newly-laid telephone cable which may weigh as much as 25 tons per nautical mile. The American Telephone and Telegraph Company, with other companies and governmental agencies, is now engaged in the construction of telephone cable systems between United States and Europe and Puerto Rico.

In addition to the brightly painted areas on its top, the buoy has several other features which help ship captains to spot it. A brightly-colored flag is mounted about eight feet above the buoy that helps to locate it in the daytime, navigational lights make it visible at night, and a reflector provides a means of detection by ships equipped with radar.

Trawlers operating near those buoys might snag buoy moorings, or hook the cable. Buoys used to anchor submarine cable are constructed of high grade boiler steel. They weigh $1\frac{1}{2}$ tons and can support six tons of moorings.



Interstate Commerce Commission

BRINED FISH UNDER REFRIGERATION MAY BE SHIPPED BY EXEMPT CARRIER:

The Interstate Commerce Commission, in a recent decision involving a motor carrier application, ruled that lightly-salted or brined fish shipped under refrigeration may be transported by exempt carriers. The Commission held that "processed fish" -- scaled, washed, slightly salted (brined), cut into portions, packaged, and shipped under refrigeration--is not a manufactured product as defined in the Transportation Act of 1958. The Act provides that ". . .fish (including shellfish). . .shall be deemed to include cooked or uncooked (including breaded) fish or shellfish when frozen or fresh (but not including fish and shellfish which have been treated for preserving, such as canned, smoked, pickled, spiced, corned or kippered products)."

Under the ruling apparently the need for further preservation such as refrigeration was the criteria used in determining that "lightly salted" or brined fish is an exempt product.

* * * * *

NEW RAILWAY EXPRESS AGENCY CONTRACTS APPROVED:

The Interstate Commerce Commission has approved the new agreement between the railroads owning the Railway Express Agency. The contract now permits the Agency to use other carriers without the railroads' approval. The Commission found that the Agency serves a useful purpose for the transportation of small shipments, and its continued existence is preferred to the entrance of other new parties into the small shipment field.

On September 4, 1959, the Agencyalso entered into a new contract with the airlines for the future performance of air express service. Under the new agreement the parties will have equal voice in performing air express service, and it covers new provisions for the sharing of revenues. It is expected that gross air express revenues for the next five years will be approximately onequarter of a billion dollars. Air express traffic for the first seven months of 1959 increased $21\frac{1}{2}$ percent to reach the highest level of activity in its history. This new contract requires the approval of the Civil Aeronautics Board.



Department of the Treasury

BUREAU OF CUSTOMS

DECISION RENDERED ON
"IMMEDIATE CONTAINER" FOR
FROZEN FISH BLOCKS:

Since no appeal was made by September 14 by the Department of Justice in the Lee Herrmann Company A/c The Coldwater Seafood Corporation vs. United States, the New York Customs Court's decision that fish blocks made from groundfish are dutiable under Tariff Paragraph 720(b), rather than Paragraph 717(b), under which groundfish fillets are dutiable, became effective September 15.

Since under Tariff Paragraph 720(b), groundfish may be dutiable at either 12½ percent ad valorem or one cent per pound, depending on whether or not the blocks are packed in bulk or in containers weighing, with contents, less than, or more than 15 pounds each, it became necessary to define "containers" or "immediate containers."

The U. S. Bureau of Customs, Washington, D. C., has ruled that for the purposes of Tariff Paragraph 720(b), the "immediate container" is the outer cardboard carton holding the 4 or 5 frozen fish blocks. The letter of September 24 addressed to the Boston Collector of Customs by the Washington office of the Bureau follows:

"...You state that the following four types of packaging are used with respect to fish blocks imported in your district:

"(a) Four or five frozen fish blocks, each weighing from 12 to 14 pounds, are packed in one cardboard carton. Each frozen fish block is wrapped in paraffin or wax paper, without sealing, to prevent the blocks from blending together, as well as to lessen dehydration during storage and shipping to the United States. The average weight of a carton containing four frozen fish blocks is 54 pounds; the average weight of a carton containing five frozen fish blocks is $67\frac{1}{2}$ pounds.

"(b) Four or five frozen fish blocks, each weighing from 12 to 14 pounds, are packed in one cardboard carton. Each frozen fish block is inserted in a pliofilm or polyethylene film bag, to prevent the blocks from blending together, as well as to lessen dehydration during storage and shipping to the United States. The weights of the packed cartons are substantially the same as under (a) above.

"(c) Four or five frozen fish blocks, each weighing from 12 to 14 pounds, are packed in one cardboard carton. Each frozen fish block is placed in a lightweight cardboard tray without top (the bottom of one tray acting as a separator between blocks), to prevent blocks from blending or sticking together, as well as to lessen dehydration during storage and shipping to the United States. The weights of the packed cartons are substantially the same as under (a) above.

"(d) Four or five frozen fish blocks, each weighing from 12 to 14 pounds, are packed in one cardboard carton. Each frozen fish block is placed in a lightweight cardboard tray or carton (with top) which completely covers the frozen fish block, to prevent the blocks from blending or sticking together, as well as to lessen dehydration during storage and shipping to the United States. The weights of the packed cartons are substantially the same as under (a) above. In packaging of this type the inner cardboard trays or cartons are not riveted, stapled or sealed.

"Representatives of the importers have appeared in the Bureau and state that the pariffin or wax paper (in (a) above), the pliofilm or polyethylene film bags (in (b) above), and the lightweight cardboard trays or cartons (in (c) and (d) above) bear no marking or legend of any kind and are ripped or torn from the frozen fish blocks and thrown away as the first step in a long process of converting the fish blocks into fish sticks, fish flakes, or fish cakes. The fish blocks

in their form as imported go no farther than the processor and never reach the retail consumer.

"The Court of Customs and Patent Appeals has stated that it is not practical to lay down a hard and fast rule by which it may be determined what is or is not an "immediate container" for the purposes of Paragraph 720 of the tariff act. In T. D. 44639 (59 Treas. Dec. 410) the court laid stress on whether the wrapper was unsealed, whether the fish in the wrapper could be carried away by a retail purchaser without first being enclosed in some other wrapper, and whether the use of the wrapper was primarily for sanitary purposes.

"In the most recent judicial decision on this subject, published as C. D. 1957 (40 Cust. Ct. 48), the court laid stress on the fact that the fish were loosely wrapped and the wrappings had no markings whatsoever to indicate the nature of the fish within the wrapper.

"The Bureau is of the opinion that in the four types of packaging outlined under (a), (b), (c), and (d) the immediate container for the purpose of Paragraph 720(b) is the outer cardboard carton holding the four or five frozen fish blocks.

"To insure that the merchandise will be so classified at each port which it may be entered, this decision is being circulated to all customs officers.

"Very truly yours,

"(s) W. E. Higman, Chief Division of Classification and Drawbacks"

"Honorable Maynard Hutchinson Collector of Customs Boston 9, Mass."



Eighty-Sixth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fish-



eries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and Senteres.

ate, as well as signature into law or other final disposition are covered.

Additional actions taken not previously reported here:

OCEANOGRAPHY: Oceanography in the United States: Hearings before the Special Subcommittee on Merchant Marine and Fisheries, 86th Congress, 1st Session, Washington, D. C.--March 3, 10, 12, 17, April 21, 23, June 23, July 13

and 14, 1959; Carderock, Md.--April 24, 1959; Boston, Mass.--June 1, 1959; Woods Hole, Mass., June 2, 1959); 399 pp., printed. Purpose was to determine to what extent the United States should go to carry out a broad and effective national program of oceanographic studies. The goal of the Subcommittee on Oceanography is to conduct a comprehensive study in the field of oceanography so that it can make positive and factual representations and recommendations to the Congress for guidance in carrying out a firm oceanographic program. Contains statements, reports, and recommendations of scientists and representatives of Government and industry. The Subcommittee heard reports on the work of the Fish and Wildlife Service in oceanography in relation to fishery investigations. It was pointed out in testimony that oceanographic fishery investigations were essential as the means of furthering knowledge of the vast food resources of the sea. The Subcommittee also queried witnesses on the effects of atomic waste disposal on offshore fish-



BOILED CORN AS FISH BAIT

The fishermen of Lake St. Basil, Macedonia, Greece, have used boiled corn as bait with remarkable results. The cost of the bait is insignificant.

--<u>Aleia,</u> September 1955.

Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, Helen Joswick, and Vera Eggleston

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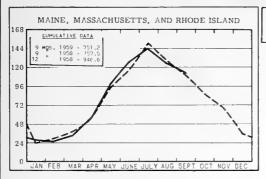
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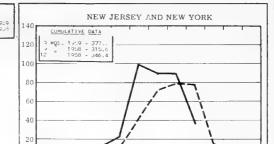
FISHERY INDICATORS

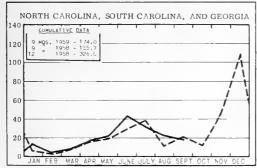
CHART I - FISHERY LANDINGS for SELECTED STATES

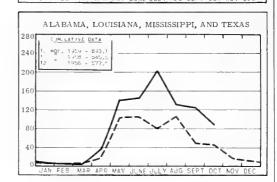
In Millions of Pounds

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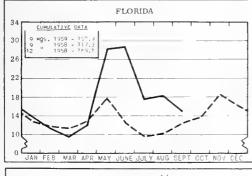


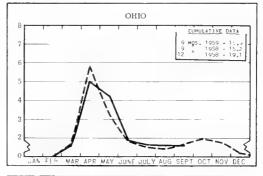


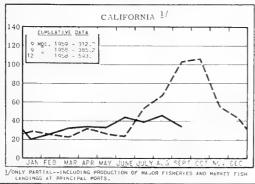




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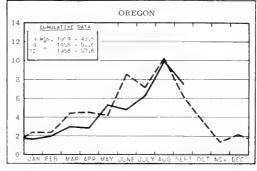
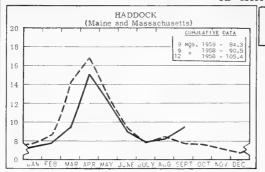
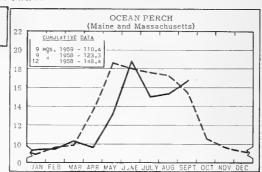


CHART 2 - LANDINGS for SELECTED FISHERIES

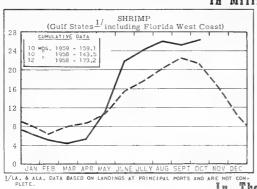
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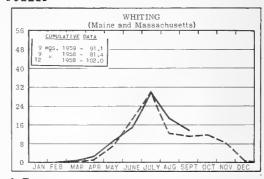
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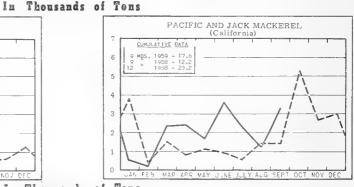


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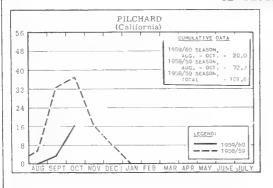


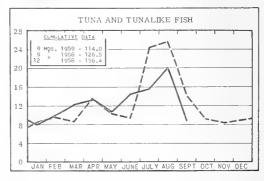


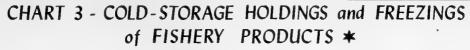
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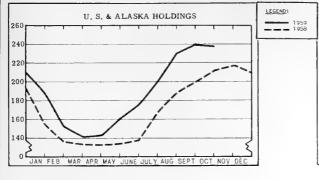
In Thousands of Tons

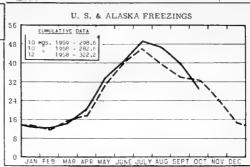


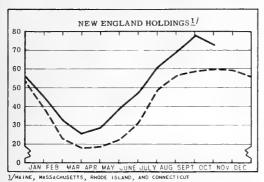


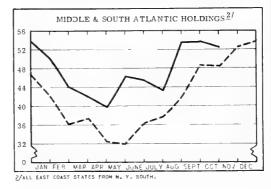


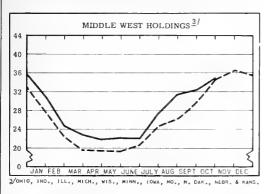
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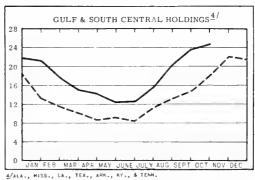


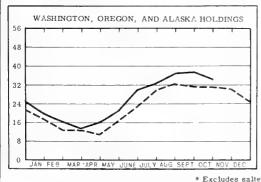


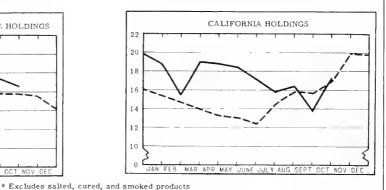


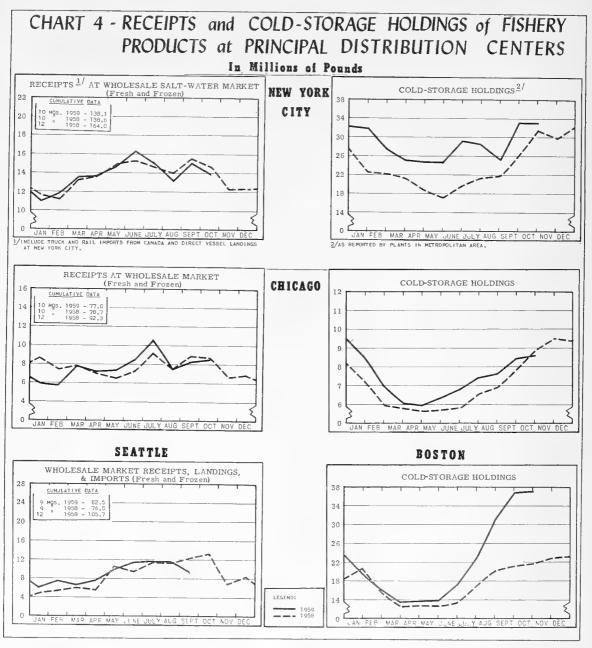












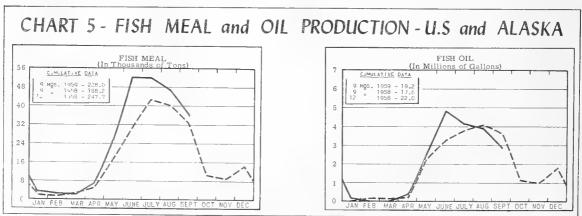
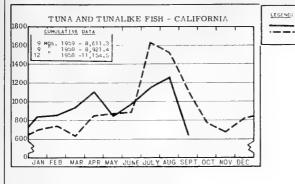
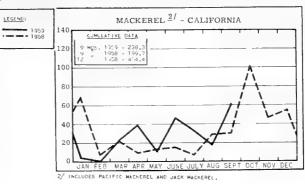
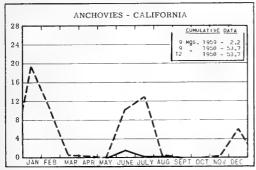


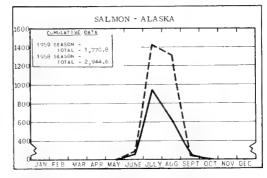
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

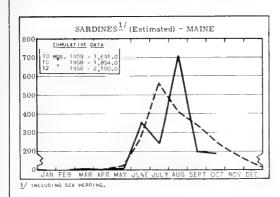
In Thousands of Standard Cases



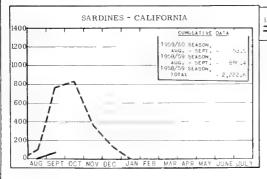








Variety	No. Cans	Designation	Net	Wgt
SARDINES	100	$\frac{1}{4}$ drawn	3 4	oz,
SHRIMP	48		5	oz.
TUNA	48	# 1 tuna	6 & 7	oz,
PILCHARDS	48	# 1 oval	15	oz.
SALMON	48	1-lb. tall	16	oz.
ANCHOVIES	48	i-lb.	8	oz.



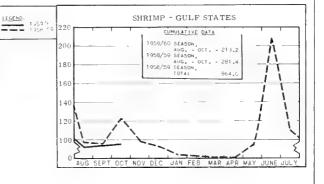
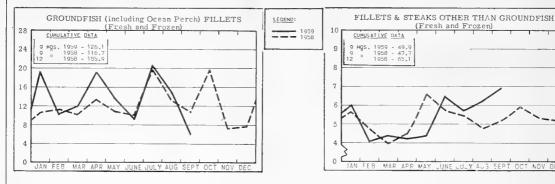
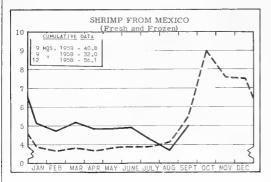
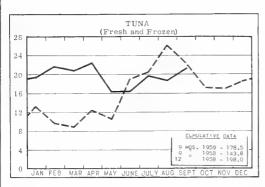


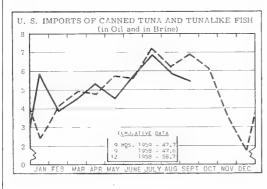
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

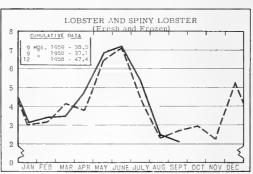
In Millions of Pounds

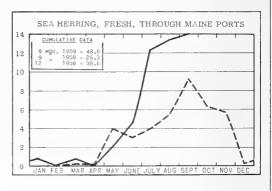


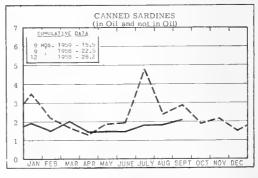














FISH AND WILDLIFE SERVICE **PUBLICATIONS**

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERV-ICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIG-NATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA,
- FISHERY LEAFLETS.

- BRANCH OF STATISTICS LISTS OF DEALERS IN AND

PRODUCES OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH. SPECIAL SCIENTIFIC REPORTS.-FISHERIES
(LIMITED DISTRIBUTION),
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES

REVIEW.

Title Number

CFS-2043 - Louisiana Landings, January 1959, 2 pp.

CFS-2086 - Louisiana Landings, February 1959, 2 pp.

CFS-2090 - Imports & Exports of Fishery Products, 1954-1958 Annual Summaries, 10 pp.

CFS-2100 - Ohio Landings, June 1959, 2 pp.

CFS-2111 - New York Landings, June 1959, 4 pp.

CFS-2114 - North Carolina Landings, July 1959, 3 pp.

CFS-2115 - Fish Meal and Oil, July 1959, 2 pp.

CFS-2116 - California Landings, April 1959, 4 pp. CFS-2118 - Louisiana Landings, March 1959, 2 pp.

CFS-2121 - Massachusetts Landings, June 1959, 5 pp.

CFS-2123 - Georgia Landings, July 1959, 2 pp.

CFS-2124 - South Carolina Landings, July 1959, 2 pp.

CFS-2125 - Florida Landings, July 1959, 7 pp. CFS-2126 - Maine Landings, July 1959, 3 pp.

CFS-2127 - New York Landings, July 1959, 4 pp.

CFS-2128 - Frozen Fish Report, August 1959, 8pp.

CFS-2133 - Middle Atlantic Fisheries, 1958 Annual Summary, 5 pp.

CFS-2134 - Mississippi Landings, May 1959, 2 pp. CFS-2136 - Alabama Landings, May 1959, 2 pp.

CFS-2138 - Mississippi Landings, June 1959, 2 pp.

CFS-2140 - Shrimp Landings, May 1959, 6 pp.

CFS-2143 - Alabama Landings, June 1959, 2 pp. CFS-2165 - Gulf Fisheries, 1958 Annual Summary, 12 pp.

FL-254 - List of Fishery Associations in the United States, September 1959 (Revised), 13 pp.

FL-292 - List of Fisheries Associations in the United States, August 1959 (Revised), 5 pp.

FL-293 - List of Fishermen's and Fish Shore Workers' Unions, September 1959 (Revised), 8 pp.

FL-354 - Reef Fishing in the Philippines, by A. F. Umali and H. E. Warfel, 28 pp., illus., 1949.

Canned Fish Consumer Purchases, 1959:

FL-478i - July, 31 pp. FL-478j - August, 31 pp.

Wholesale Dealers in Fishery Products (Revised): SL- 12 - Virginia, 1959.

SL- 44 - Nebraska (Missouri River and Tributaries), 1959.

SL-113 - Firms Canning Crab Meat, 1958.

SSR-Fish No. 285 - Estimating Maximum Fishing Depth of Longline Gear with Chemical Sounding Tubes, by Joseph J. Graham and Dorothy D. Stewart, 19 pp., illus., December 1958. Asummary of methods used by various investigators to estimate the fishing depth of longline is given. Sounding tubes, used by Pacific Oceanic Fishery Investigations biologists in conjunction with studies of albacore tuna, Germo alalunga (Bonnaterre), in the central North Pacific, measure the depth of the long line with considerable accuracy. A method, using readings provided by the tubes, is developed so that the observed "hang" of a given basket of gear and the theoretical "hang" can be compared. It is suggested that distortions related to retrieving procedures can be overcome. A technique is shown by which the maximum fishing depths for individual hooks along an entire set of gear can be estimated.

SSR-Fish No. 302 - Experimental Fishing to Determine Distribution of Salmon in North Pacific Ocean and Bering Sea, 1956, by Mitchell G. Hanavan and George K. Tanonaka, 26 pp., illus., May 1959. Five vessels were employed from May to October 1956 to study the distribution of Pacific salmon in the North Pacific Ocean and Bering Sea. The operation was designed to provide samples of fish for racial identification to provide evidence of seasonal movements and changes in the distribution of salmon; and to study the ocean habitat and conditions that control the distribution, movement, and survival of salmon. The area of operation was approximately 2 million square miles extending from the coast of Washington and Oregon. Within this area 195 gill-net sets resulted in the capture of 7,963 salmon. The fish were measured on board before freezing. Length frequencies are shown graphically in the report by species and area and in relation to the mesh size in which the fish were captured.

SSR-Fish No. 304 - Biology of Chinook and Blueback Salmon and Steelhead in the Wenatchee

River System, by Robert R. French and Roy J. Wahle, 21 pp., illus., June 1959.

SSR-Fish No. 307 - Fishery Management Studies on the Madison River System in Yellowstone National Park, by Norman G. Bensen, Oliver B. Cope, and Ross V. Bulkley, 33 pp., illus., May 1959.

SSR-Fish No. 309 - Ecology of the Sheepscot River Estuary, by Alden P. Stickney, 25 pp., illus., May 1959.

Operations of the Bureau of Commercial Fisheries under the Saltonstall-Kennedy Act, Fiscal Year 1958, 75 pp., illus., processed. The fourth annual report to the Congress of the activities of the U.S. Bureau of Commercial Fisheries during the fiscal year 1958 under the provisions of the Saltonstall-Kennedy Act of July 1, 1954. The Act makes available funds from import duties on foreign fishery products for the promotion of the free flow in commerce of domestic fishery products and provides funds for a range of research and services in support of the conservation and development of the fishery resources and the stabilization of the fishery industry. Among the important biological research programs of work during fiscal year 1958: (1) in New England, research on the sea scallop revealed means of increasing the overall yield from the sea scallop fishery by regulating the size of the metal rings in the dredges; (2) on the Pacific Coast, new and expanded high-seas oceanographic studies added to knowledge on sardine populations, especially the relationship between water temperature and spawning; and (3) studies in Alaska gave valuable information on improving the effectiveness of present salmon harvesting regulations and made considerable progress in accurately predicting the sizes of future salmon runs. In the industrial field, new or expanded emphasis in research was placed on: (1) improving the quality of fishery products, the development and promulgation of grade standards, and conducting voluntary inspection in fish processing plants; (2) finding new uses for fish oils; (3) determining the nutritive values of fish meals in animal feeds; (4) improving the processing and marketability of fishery products; and (5) broad economic research dealing with the soaring costs of marine insurance, fishery transportation costs, domestic production costs of U.S. groundfish and albacore, production costs of these same species in major competing countries, consumer reaction to present marketing techniques, and studies of fresh fish consumption and the industrial feeding market. New or expanded service functions included: (1) the collection of detailed biological and economic statistical data on shrimp in the South Atlantic and Gulf areas to provide better data to the industry on a current basis; (2) expanded reporting services on prices and market conditions for frozen fishery products at key marketing centers, current reporting on imports of fishery products and byproducts at main ports of entry, and coverage of prices and market conditions for canned fishery products; (3) the collection and distribution of market information on fishery receipts and wholesale prices at Baltimore, Md.; (4) new and expanded explorations for fishery species including shrimp, king crab, clams, industrial fish, snapper, and tuna; and (5) expanded fishery education and market development functions including kitchen-testing, fish-cookery demonstrations, market promotion, and visual education.

Sep. No. 565 - Shrimp Exploration by the M/V Oregon along the Northeast Coast of South America.

Sep. No. 566 - Influence of Vessel-Handling Practices on Formation of Black Spot in Shrimp.

Sep. No. 567 - Fish and Shellfish Purchases by Public Schools with Food Services, 1957-58.

Sep. No. 568 - Research in Service Laboratories (November 1959): Contains these articles--"Chemical Composition of Pacific Coast Fish and Shellfish;" "Freezing and Cold Storage of Pacific Oysters and Fresh-Water Fish;" "New Products from Fish Oils--Monoglycerides;" "Study of Chemical Compounds Formed During Spoilage of Fish;" and "Thread Herring Meal Nutritional Studies."

Sep. No. 569 - Use of Plastic Sheets for Conversion of Soft, Muddy Bottoms into Oyster Beds.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ON LY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Comparison of Variations of Fishing Condition in a Whole Year Among Each Subarea and Migration of Fish Groups in the Southern Part of the Pacific Ocean, by Jun Nakagomo, 5 pp., processed, translation. (Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 12, 1959, pp. 957-960.)

Correlation between the Movement and Appearance of Fish School, by Toshiro Euroki, 15 pp., processed, translated from Japanese. (Reprinted from Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 7, February 1959, pp. 87-101.)

Migration and Behavior of Large Scad in the Black Sea, by V. N. Tikhonov, 16 pp., processed, translated from Russian. (Reprinted from Behavior of Fish and Commercial Exploration, V. N. 1. R. O., Trudy, vol. 36, pp. 52-61.)

Observations on the Reaction of Black Sea Anchovies and Some Other Fishes to Artificial Irritants, by N. N. Danelevsky and D. V. Radakov, 8 pp., processed, translated from Russian. (Reprinted from Behavior of Fish and Commercial Exploration, V. N. I. R. O., Trudy, vol. 36, pp. 25-32.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE FOR LIMITED DISTRIBUTION FROM THE U.S. FISH AND WIDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Catch Variations in the North Pacific Albacore.

I--Recruitment and Dispersion of the North Pacific Albacore, by Akira Suda, 24 pp., Illus., processed. (Translation of Report of Nankai Regional Fisheries Research Laboratory, no. 9, December 1958, pp. 103-116.)

Catch Variations in the North Pacific Albacore.

II--Variation in the Amount of Recruitment, by
Akiro Suda, 22 pp., illus., processed. (Trans-

- lation of Report of the Nankai Regional Fisheries Research Laboratory, no. 10, March 1959, pp. 72-87.)
- Fishing Condition of the Indian Ocean, by Koya Mimura, 3 pp., processed, translation. (Tuna Fishing, no. 53, October 1958, pp. 25-26, The Investigative Society of Tuna Fishery, Kangawa Prefecture, Japan.)
- On the Migration and the Growth of the Skipjack,
 KATSUWONUS PELAMIS (Linnaeus), in the Izu
 and Bonin Sea Areas and the North-Eastern Sea
 Area Along the Pacific Coast of Japan, by
 Tsuyoshi Kawasaki, 34 pp., illus., processed,
 translation. (Bulletin of Tohoku Regional Fisheries Research Laboratory, no. 4, March 1955,
 pp. 101-119.)
- On the Migration and the Growth of the Skipjack,
 KATSUWONUS PELAMIS (Linnaeus), in the
 South-Western Sea Area of Japan, by Tsuyoshi
 Kawasaki, 34 pp., illus., processed, translation.
 (Report of Tohoku Regional Fisheries Research
 Laboratory, no. 4, pp. 83-100.)
- On the Nitrogen Cycle and Cultivable Capacity of Fish in the Balanced Aquarium, by Artisune Saeki, 15 pp., illus., English translation, processed. (Translated from the Japanese Journal of Limnology, vol. 19, nos. 3 & 4, March 1958, pp. 118-129.)

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

- (Baltimore) Monthly Summary-Fishery Products, June, July, August 1959; 6, 6, and 7 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Includes arrivals of fresh and frozen fishery products receipts by original receivers on the Baltimore Wholesale Fish Market, for the months indicated.
- California Fishery Products Monthly Summary,
 July 1959; 13 pp. (Market News Service,
 U. S. Fish and Wildlife Service, Post Office
 Bldg., San Pedro, Calif.) California cannery
 receipts of tuna and tunalike fish, mackerel, and
 anchovies; pack of canned tuna, mackerel, and
 anchovies; market fish receipts at San Pedro,
 Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices;
 ex-vessel prices for cannery fish; American
 Tuna Boat Association auction sales; for the
 month indicated.
- Gulf Monthly Landings, Production, and Shipments of Fishery Products, June, July and August 1959, 6 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shell-fish on the New Orleans French Market; sponge sales; and fishery imports at Port Isabel and Brownsville, Tex., for the months indicated.
- New England Fisheries -- Monthly Summary, August 1959, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth

- Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and exvessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.
- New York City's Wholesale Fishery Trade--Monthiy Summary for May and June 1959, 20 and 22 pp., respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.
- (Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, August 1959, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASH-INGTON 25, D. C.

How to Cook Scallops, by Dorothy M. Keller. Paula W. Lemmon, and Rose G. Kerr, Test Kitchen Series No. 13, 19 pp., illus., printed, 20 cents, 1959. Contains 39 choice kitchen-tested recipes for cooking scallops and a generous number of illustrations. Inasmuch as scallops are marketed in the form of dressed meat, many people do not know that they are a shellfish--a mollusk possessing two shells, similar to oysters or clams. The scallop moves around in the water by actively snapping its shells together. This shell-snapping results in the development of an oversized muscle called the "adductor muscle." This excellently-flavored muscle is the only part of the scallop eaten by Americans. Europeans, however, eat the entire scallop. There are two varieties of scallops -- the large sea scallop and the smaller bay scallop. The sea scallop is taken from the deep waters off the northern and middle Atlantic States. The bay scallop is taken from inshore bays and estuaries from New England to the Gulf of Mexico and in the Pacific Northwest. Scallops, according to the new booklet, are marketed all year but are at their best when taken from November to April. Fresh scallops are a light cream color, sometimes varying to a delicate pink. Scallops are available fresh or frozen, but only in the form of dressed meat, as the scallops are opened, packed, and iced at sea.

Fresh scallops and frozen scallops when thawed, should have a sweetish odor. When bought in packages, they should be practically free of liquid. Both the sea and the bay scallop have a lean, light, firm meat and a sweet flavor. Both contain high levels of well-balanced protein, very little fat, and many of the minerals and vitamins so necessary for good health.

Life History of the Sea Lamprey of Cayuga Lake, New York, by Roland L. Wigley, Fishery Bulletin 154 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 561-617, illus., printed, 40 cents, 1959.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE OR-GANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALEWIVES:

The Run, by John Hay, 192 pp., illus., printed, \$3.95. Doubleday & Company, Inc., Garden City, N. Y., 1959. An unusual and beautifully written book about the alewife run up the streams of Cape Cod in the spring. The author describes his observations from late winter, before the onset of the adult alewife migration up the rivers and streams, until mid-July, when the offspring begin to swim down toward the open sea. The alewife fishery, once one of great economic importance in New England both for food and fertilizer (alewives planted along with the seeds were said to make the corn grow tall and plump), has now degenerated to an unimportant bait fishery. Yet the author has brought together the scientific aspects and the poetry and philosophy inherent in the great spawning migrations of the alewife. The book includes, among others, chapters on the arrival, the reproductive urge, and the nature of an alewife; and migration from salt- to freshwater. In his conclusion, the author explains: "The mystery about the travels of birds, eels, monarch butterflies, or alewives, is not only a matter of routes or seasonal behavior. It has to do with an internal response to this spinning globe and its unendingly creative energies."

BRITISH GUIANA:

Review of the Fisheries of British Guiana in 1958, Bulletin No. 1,53 pp., illus., printed. Fisheries Division, Department of Agriculture, Georgetown, British Guiana, 1959. Summarizes the work of the British Guiana Fisheries Division in 1958 as well as current progress and developments and future objectives. Discusses, among others, the following topics: fishing grounds and operational areas, fishing methods and gear, wholesale markets, seasonal fluctuations of fish supplies, pond cultivation progress, aquarium fish (rade, and imports of fishery products. The report also contains sections on trawling, snapper fishing, cooperatives, fishery loans, and research projects. Includes a number of charts

and graphs as well as statistical tables on landings and prices of fishery products.

BYPRODUCTS:

"Marine Products - Parts I and II," article, The Feed Bag (Buyers' Guide of 1959), pp. 76-80, printed. Editorial Service Company, 1712 W. St. Paul Ave., Milwaukee 3, Wis. Describes a number of marine products used in the manufacture of animal feeds. Part I presents details of place of origin, chemical composition, and use of fish meals--menhaden, sardine, herring, salmon, white fish, crab, and shrimp. Part II is devoted to other marine products such as condensed fish solubles, dried fish solubles precipitate, homogenized condensed fish, fish bonemeal, and kelp meal.

CANADA:

Fisheries Statistics of Canada - Newfoundland, 1957, 28 pp., printed in French and English, 50 Canadian cents. The Queen's Printer and Controller of Stationery, Ottawa, Canada, August 1959. Presents statistical tables showing quantity and value of Newfoundland's principal species of fish and shellfish; capital equipment in the primary fishery operations; and number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1957 (Quebec), 59 pp., illus., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1959. Consists of tables giving the quantity and value of the principal species of fish and shellfish landed in Quebec in 1939-57; quantity and value of landings by species and fisheries districts, 1956-57; capital equipment employed in the primary fisheries operations by fisheries districts, 1956-57; number of persons engaged in the fisheries by fisheries districts, 1956-57; and quantity and value of manufactured fishery products by species and fisheries, 1956-57.

Journal of the Fisheries Research Board of Canada, vol. 16, no. 4, August 1959, 177 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, these articles: "Biochemical Studies on Sockeye Salmon During Spawning Migration. VI--Ribonucleic Acid and Deoxyribonucleic Acid," by Vera M. Creelman and Neil Tomlinson; "Fatigue and Mortality in Troll-Caught Pacific Salmon (Oncorhynchus)," by R. R. Parker, E. C. Black, and P. A. Larkin; "Factors Affecting the Nitrite Content of Treated Fish Fillets, by C. H. Castell and Maxine F. Greenough; "Variation in the Annual Average Weight of Chum Salmon Caught in British Columbia Waters, 1946 to 1958," by H. Godfrey; "Comparison of Certain Scottish and Canadian Experiments in Respect of Grading Fish for Quality," by J. M. Shewan and A. S. C. Ehrenberg; "Biochemical Studies on Sockeye Salmon During Spawning Migration. VIII -- Androgen Content of Testes, D. R. Idler and H. Tsuyuki; and "Studies on the Conversion of Fish Stickwater to Solubles. IV--Effect of Enzyme Treatment on the Viscosity of Whale Solubles," by J. R. McBride, R. A. Mac-Leod, and D. R. Idler.

Operations of Modern Longliners and Draggers, Atlantic Seaboard, 1952-1957, by John Proskie, Primary Industry Studies No. 1, vol. 7, part 1,

70 pp., illus., processed. Economics Service, Department of Fisheries of Canada, Ottawa, Canada, 1958. This is the first part of the seventh annual progress reports on the study of the operations of modern fishing craft on the Atlantic seaboard. Contains a brief analysis of the trends established over the six-year period that the study has been in progress, including impact of the program, costs and earnings, factors affecting the size of the investment, prices and volume of output as related to break-even, and trends in incomes of fishermen. The tables contain a detailed comparison of results for the various types and size-classes of fishing craft. The second part, containing a summary of the data collected during the 1957 season, was published in August 1958. The objective of the program is to obtain information on the success of the modernization program and guidance for the development of future policy in this field.

CANNING:

Preventing Struvite Formation in Thermally
Treated Seafoods, by Walter A. Zachowski and
Carl R. Fellers, U. S. Patent 2,870,025, January 20, 1959. U. S. Patent Office, Washington 25, D. C.

COD

"The Portuguese Like Canadian Cod," by Richard Grew, article, Foreign Trade, vol. 112, no. 5, August 29, 1959, pp. 16, 17, printed. Queen's Printer and Controller of Stationery, Government Printing Burgau, Ottawa, Canada. Although Portuguese fishing fleets land large quantities of cod from the grounds off the coasts of Newfoundland, Labrador, and Greenland, the total catch is still insufficient to meet the demand in Portugal. Consequently, a large quantity of dried- and wet-salted cod is imported, principally from Iceland, Norway, France, Canada, Germany, and the Faroe Islands. Canadian cod is much in demand especially if the size of fish and market price meet local needs.

CONSUMPTION:

How American Buying Habits Change, 266 pp., illus., printed, \$1. U. S. Department of Labor, Washington 25, D. C., 1959. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This book describes the improvements in living standards which Americans have achieved since 1888. It describes the changes in the consumption habits of the American people and concentrates on the middle group of consumers—the families of the millions of blue-collar and white-collar workers who make up the vast bulk of our predominantly city life. In the chapter on "meals, menus, and market baskets," it discusses the evolution in diets and food marketing; improvements in nutrition; and food in the family budget.

CRAWFISH:

"Pilot Crawfish Farm," article, Louisiana Conservationist, vol. 11, no. 9, September 1959, pp. 9-10, 28 illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Describes a projected pilot crawfish farm, reportedly the first of its kind in the world, to be established near Henderson, La., under the supervision of the Louisiana Wild Life and Fisheries Commission. As pounds per acre per year is the yardstick by which crop production is measured, the crawfish culture units will be an acre each. Three of these will be combined into a single pilot farm, where variables can be tested side by side. The results obtained are expected to provide answers to questions on the most efficient size for culture units; best depth of water; preparation of the shoreline; fertilization of ponds; best types of vegetation for food, shade, and protection; number of breeders needed; supplemental feeding; predator control; yield per acre; and the profits in such a venture.

ELECTRICAL FISHING:

"La Pesca con Electricidad" (Electrical Fishing), article, Mar y Pesca, vol. 2, no. 1, January-July 1959, pp. 10-13, illus., printed in Spanish. Instituto Nacional de la Pesca, Havana, Cuba.

ENZYMES:

"Certain Enzymes Can Provide Human Food and General Feed Products from the Trash Fish of the Sea," by W. W. Meinke, article, Texas Engineering Experiment Station News, vol. 10, no. 1, March 1959, pp. 3-6, illus., printed. Texas Engineering Experiment Station, Texas A. & M. College System, College Station, Tex. This article describes experimental work with the use of enzymes to accomplish scaling and visceration of trash fish. Since the catch of trash fish incidental to the shrimp fishery alone is estimated at over 2 billion pounds a year, the economic value to such a process, if it can be applied on an industrial basis, will be great. Products obtained include edible fish, fish solubles, and fish oil.

FISH BEHAVIOR:

"Studies on Social Groupings in Fishes," by C. M. Breder, Jr., Bulletin of the American Museum of Natural History, vol. 117, article 6, pp. 393-482, printed, \$1.50. Library, American Museum of Natural History, Central Park West at 79th St., New York, N. Y., 1959.

FISH CULTURE:

Control of Chironomid Larvae in Milkfish Ponds, by Yun-An Tang, and Tung-Pai Chen, Fisheries Series, No. 4, 41 pp., illus., printed, 12 U. S. cents. The Joint Commission on Rural Reconstruction, 25 Nanhai Road, Taipei, Taiwan, China, June 1959.

FISH POPULATIONS:

"Significance of Trap-Net Selectivity in Estimating Population Statistics," by William C. Latta, article, Papers of Michigan Academy of Science, Arts & Letters, vol. 44, 1959, printed. Institute for Fisheries Research, Michigan Department of Conservation, University Museum Annex, Ann Arbor, Mich.

FOOD AND AGRICULTURE ORGANIZATION: The Application of Science to Inland Fisheries, by E. D. Le Cren, Fisheries Study No. 8, 56 pp.,

printed, 50 cents. Food and Agriculture Organization of the United Nations, Rome, Italy, 1958. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) Reviews the biological basis of fish production in inland waters (including migratory- and brackish-water fisheries). Describes production and fish cropping; physical and chemical factors influencing algal growth; the principal types of food eaten by fish; the principles underlying the efficiency of conversion of food into fish growth and production; and the concept of the "production" of fish, with emphasis on survival, growth, and mortality. Also reviews the importance of adequate recruitment and the value of artificial hatching and rearing; the possibilities of increased control of natural processes; the relationship between fisheries and other human activities such as farming, dams, and reservoirs; and the past research in limnology and fishery biology.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 5, May 1959, 217 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Fishing Installations in Saline Lagoons, by Ruggero De Angelis, General Fisheries Council for the Mediterranean, Studies and Reviews No. 7, August 1959, 36 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy. Presents the text and plates of technical paper no. 34 on fishing in saline lagoons, given at the Fifth Meeting of the General Fisheries Council for the Mediterranean at Rome on October 13-18, 1958. Describes the historical and modern use of barrages, trelliswork, and screens for trapping migratory fish in coastal lagoons. Includes a number of detailed drawings depicting the construction and method of operation of various types of installations. The description demonstrates the efficiency of this system, in which the young fry can escape and the sea bottom is not disturbed, two disadvantages of all floating devices.

United Kingdom: The Antioxidant in Food Regulations, 1958, Food and Agricultural Legislation, vol. 7, no. 4, XI.9/58.4, 8 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

Yearbook of Fishery Statistics, 1957 (International Trade), vol. VIII, 347 pp., processed in English, French, and Spanish, US\$4. Food and Agriculture Organization of the United Nations, Rome, Italy, 1959. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) With this issue of the FAO Yearbook, the Fisheries Division resumes publication of statistics relating to international trade in fishery products last presented in 1955, in vol. IV, part II, which covers the years through 1953.

This volume devotes one section each to seven groups of fishery commodities defined in the FAO Fishery Statistical Classification--(1) fish, fresh, chilled, or frozen; (2) fish, dried, salted, or smoked; (3) crustaceans and molluscs, fresh, dried, salted, etc.; (4) fish, crustaceans, and molluscs, canned; (5) fish, crustacean, and mollusc preparations, not in airtight containers; (6) aquatic animal oils and fats, crude or refined; and (7) aquatic animal meals and similar products. Each section contains a table summarizing aggregate imports and exports by country for that commodity group; a series of synoptic tables showing the flow of exports from the principal exporting countries to the more important destinations; and a series of tables presenting the details of the exports of individual fishery products from the principal exporting countries. These 7 sections are preceded by 4 general summary tables and followed by notes and a table of conversion factors. Data are given in most tables for 1948 and for 1953 through 1957.

FROGS:

"La Rana Toro, su Existencia y Aprovechamiento en Cuba" (The Bullfrog, its Life History and Cultivation in Cuba), by Federico Gomez de la Maza, article, Mar y Pesca, vol. 2, no. 1, January-July, 1959, pp. 8-9, illus., printed in Spanish. Instituto Nacional de la Pesca, Havana, Cuba.

GEAR:

Commercial Fishing Gear and Fishing Methods in Florida, by J. B. Siebenaler, Technical Series No. 13, 45 pp., illus., printed. Florida State Board of Conservation, Tallahassee, Fla.

GENERAL:

Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 3, September 1959, illus., printed. The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla. Includes, among others, the following articles: "Spotted and Brown Shrimp Post-Larvae (Penaeus) in North Carolina," by Austin B. Williams; "The Green Turtle (Chelonia mydas mydas) in Florida," by Archie Carr and Robert M. Ingle; "Distribution of the Blue Marlin and Black Marlin in the Indo-Pacific," by James E. Morrow, Jr.; and "Decarboxylation Pathways of Amino Acids in Fish Tissue," by J. Claudatus, P. Gutierrez, and D. Lefemine.

Caracteristicas de Algunos Peces Comerciales y Otros que lo Pueden les en el Futuro (Characteristics of Some Commercial Fishes and Others Which May Become Important in the Future), by L. Navarro, 36 pp., illus., printed in Spanish. Secretaria de Marina, Mexico, D. F.

Fisheries Research Papers, vol. 2, no. 2, April 1959, 98 pp., illus., printed. Department of Fisheries, Olympia, Wash. Includes among others the following articles: "The Fishery for Herring (Clupea pallasii) on Puget Sound," by R. Walter Williams; "Survival of Downstream Migrant Salmon Passing Alder Dam in an Open Flume," by Dale E. Schoeneman; "The Larval

Development of the Sand Sole (Psettichthys melanostictus)," by Cleveland P. Hickman, Jr.; "Commercial Salmon Fishing Intensity in Puget Sound, 1939-1955," by Charles O. Junge, Jr.; "Efforts of Stream Dredging on Young Silver Salmon, Oncorhynchus kisutch, and Bottom Fauna," by William H. Rees; "Tagging Experiments on Sablefish at Holmes Harbor, Wash.," by Alonzo T. Pruter; "Migration and Fishing Mortality Rates of Columbia River Spring Chinook Salmon in 1955," by Henry O. Wendler; "A Study of Localized Predation on Marked Chinook Salmon Fingerlings Released at McNary Dam," by Richard B. Thompson; and "Calculated Minimum Contributions of Washington's Hatchery Releases to the Catch of Salmon on the Pacific Coast and the Coasts Assessable to Hatchery Operations," by C. H. Ellis and R. E. Noble.

Increasing Profits from Fish, by John P. Carroll, Kirby M. Hayes, and Paul Paradis, Publication No. 340, 8 pp., illus., printed. Mailing Room, Extension Service, University of Massachusetts, Amherst, Mass. This leafiet for food retailers outlines briefly and concisely points to be observed in buying, storing, selling, and increasing sales of top-quality fish in order to achieve increasing profits. Humorously illustrated, it is of practical value to food stores handling fishery products.

"Meeting Tomorrow's Fish and Wildlife Needs," by Arnie J. Suomela, article, Extension Service Review, vol. 30, no. 6, June 1959, pp. 127, 138 illus., printed, single copy 15 cents. Federal Extension Service, U. S. Department of Agriculture, Washington 25, D. C. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) Discusses program planning in the U. S. Fish and Wildlife Service to meet future needs. The interrelation and interdependence of all resources are stressed. The Bureau of Commercial Fisheries seeks to maintain fisheries at the point of maximum sustained yield with peak efficiency for the fisherman's effort. Closer cooperation between the Departments of Agriculture and Interior and the furtherance of conservation education are required to achieve program objectives.

The Open Sea, Its Natural History, Part II: Fish and Fisheries (with Chapters on Whales, Turtles, and Animals of the Sea Floor), by Alister Hardy, 322 pp., illus., printed, \$7.50. Houghton Miflin Co., 2 Park St., Boston 7, Mass. Describes the history and habits of fish in general, life on the ocean floor, fish parasites, herring, haddock, and the fishing industry.

Statistical Abstract of the United States, 1959

(80th Annual Edition), 1054 pp., illus., printed,
\$3.50 (buckram). U. S. Bureau of the Census,
Washington, D. C., 1959. (For sale by the Superintendent of Documents, U. S. Government
Printing Office, Washington 25, D. C.) This is
the standard summary of statistics for the most
recent year available on the social, political,
and economic organization of the United States.
It contains, among others, a section on fisher-

les which presents briefly statistics relating to quantity and value of catch, fishermen and fishing craft, catch of principal species, canned and frozen fishery products, and foreign trade in fishery products. The principal sources of these data on fisheries are reports published by the Fish and Wildliffe Service.

Turn to the Sea, by Athelstan Spilhaus, 46 pp., illus., printed. National Academy of Sciences, National Research Council, Washington, D. C., 1959. An interestingly-written and informative narrative describing the resources and potentialities of our oceans. It discusses recent and important developments in oceanography and the marine sciences and includes a chapter on fishery resources.

United States Coast Pilot No. 7--California, Ore-gon, Washington, and Hawaii, 383 pp., printed, \$3. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C. The latest edition of this publication supersedes the 1951 edition of Coast Pilot 7 and cancels the 1950 edition of Coast Pilot 10, which formerly covered the Hawaiian Islands in a separate volume. The eighth edition covering the Pacific Coast and Hawaii is based on the work of the Coast and Geodetic Survey and includes the results of Coast Pilot field inspections made in 1957. It contains nautical information that required more than 800 pages in the previous books. New editions are published about every seven years, and supplements, containing changes and new information, are published annually and distributed free. The latest supplement together with Notices to Mariners subsequent to it will correct the Coast Pilot to date. A combination atlas, encyclopedia, geography text, and nautical guidebook, the Coast Pilot contains information of importance to the navigator of United States coastal waters. Most of this information cannot be shown conveniently on the standard nautical charts and is not readily available elsewhere. Subjects include landmarks, navigation regulations, channels, anchorages, dangers, routes, weather, ice, pilotage, and port facilities. The Pacific Coast has phenomena that are all its own. San Francisco's fogs are of three kinds: the summer afternoon sea fog that forms a cliff of white vapor and moves inland at an average of 16 miles an hour; the tule fog which is a low-lying dense land or river fog that forms on winter mornings and drains slowly seaward; and a nondescript fog,. consisting of a mixture of city smoke, dust and vapor, which drifts slowly seaward in the morning, and returns as a dark cloud about 1 p.m. before the west wind. The Santa Ana, a desert wind that blows offshore, usually in or near San Pedro Bay, may reach a speed of 52 knots and gives the mariner little warning. Rocks and currents make coastwide navigation dangerous. especially in thick weather; many of the rocks are marked by kelp, which can be seen on the surface during the summer and autumn. The first Pacific Coast Pilot was written a little over a century ago by George Davidson, one of the Survey's most renowned scientists, and appeared in the Survey's report for 1858. Davidson's

successors, although they must speak the language of the sea, have kept high standards of clarity and English.

INDIA:

The Indo-Norwegian Project in Kerala, by Per Sandven, 147 pp., illus., printed. Norwegian Foundation for Assistance to Underdeveloped Countries, Oslo, Norway, 1959. Describes the work of the Foundation, a state-sponsored and public-supported organization, in assisting to develop the fishing and fish-handling and marketing industries, as well as health and sanitation facilities, in the Indian state of Kerala. The project was undertaken under the auspices of the United Nations expanded program of technical assistance, except that the funds are applied not only for providing technical experts, services, and training, but also for capital assistance in the form of equipment and machinery. The project was initiated in 1952 with the signing of a tripartite agreement between India; Norway, and the United Nations and three fishing communities in this southwestern India state, which were selected for aid. Accomplishments have been encouraging in mechanization of fishing boats, provision for repair facilities, introduction of new types of fishing gear, improvement of processing and curing methods, building of ice-producing plants, supplying insulated trucks and vessels for transport of fresh fish, organization of fishermen's cooperatives, improvement of environmental sanitation with main stress on the supply of drinking water, and establishment of a health station. The author reminds us in his conclusion that "The underdeveloped nations need foreign experts and capital in their struggle to achieve greater economic growth. They must be helped to be able to help themselves build their countries."

Notes on Eggs, Larvae and Juveniles of Fishes from Indian Waters. 1--XIPHIAS GLADIUS (Linnaeus), by S. Jones, 5 pp., illus., printed. (Reprinted from Indian Journal of Fisheries, vol. 5, no. 2, 1958, pp. 357-361.) Central Marine Fisheries Research Station, Marine Fisheries P. O., Mandapam Camp, South India.

The Tuna Live-Bait Fishery of Minicoy Island, by S. Jones, 8 pp., illus., printed. (Reprinted from Indian Journal of Fisheries, vol. 5, no. 2, 1958, pp. 300-307.) Central Marine Fisheries Research Station, Marine Fisheries P. O., Mandapam Camp, South India.

INTERNATIONAL CONFERENCES:

Fish Processing Technologists Meeting, Rotterdam, June 25-29, 1956, Symposium Papers Nos. 1-25, processed. Food and Agriculture Organization of the United Nations, Rome, Italy. Contains papers on: "Use of Preservatives and Antibiotics in the Preservation of Fresh Fish," by H. L. A. Tarr; "Antibiotics as Aids in Fish Preservation. II - Further Studies on Fish Fillets," by Peter Yakoubovsky-Lerke and Lionel Farber; "The Use of Antibiotics for Extending the Freshness of Fish and Shellfish," by R. Pasternack, A. S. Malaspina, C. L. Wrenshall, and R. C. Ottke; "Effectiveness of Aureomycin on

Keeping Quality of Several Demersal Fish," by T. Tomiyama, Y. Yone, and S. Kuroci; "Aureomycin as an Ice Additive," by B. Albertsen; "Experiments with Bacteriostatic Ices on Fish," by J. Bystedt and A. Liljemark; "Can We Extend the Keeping Time of Chilled Fish with Antibiotics," by Sverre Hjorth-Hansen; "Icing Cod with Salt Water Ice," by Poul Hansen; "Fresh Water Preservation," by H. L. A. Tarr; "Observations on the Use of Prechilled Brines for the Temporary Storage of California Sardines and Mackerel," by Lionel Farber; "Some Observations Concerning the Brine Cooling of Fish Aboard a Fishing Vessel," by Joseph W. Slavin; "Fresh Fish Quality Assessment in the Commercial Fish Inspection," by Poul Fr. Jensen; "The Sensory Assessment of Iced White Fish by a Panel Technique," by J. M. Shewan and A. C. S. Ehrenberg; "Danish Studies of the Storage of 'Wet' Fish at Temperatures Close to 0° C. Procedure for Operators. C. Procedure for Organoleptic, Bacteriological and Chemical Assessment of Freshness. by Poul Hansen; "Recent Work on the Use of 'Total Volatile Bases' and Trimethylamine Contents and Tetrazolium Salt Reduction for Assessing the Quality of Iced Fish," by J. M. Shewan and J. Liston; "Preliminary Results of Some New Tests for Fresh-Fish Quality;" "The Objective Assessment of Raw Fish Quality," by Lionel Farber and P. Y. Yerke; "A Rapid Method for the Estimation of Volatile Bases in Fish Muscle," by W. A. Montgomery; "The Applicability of the Vacuum Distillation Technique for the Determination of Volatile Acids and Volatile Bases in Fish Flesh," by Antonio A. Da Costa, Tetuo Timiyama, and Joseph W. Stern; "Public Health Aspects of the Use of Antibiotics in Foods," by Chr. Engel; "An Enzymatic Method for Evaluating the Acceptability of Bactericidal Ice," by W. Partmann; "The Use of Ice as a Counter Agent to an Anaerobic Environment in Iced Demersal Fish, by W. A. MacCallum; and "Appreciation de l'Alteration du Poisson Frais par un Examen Organoleptique Systematique" (Estimation of Fish Spoilage by Means of Systematic Organoleptic Examination), by France Soudan, J. Bazin, G. Chapel, E. Seynave, and A. Daknoff. These papers are available individually from the above mentioned address.

IRELAND:

Fisheries (Amendment) Act, 1958, No. 15 of 1958, 59 pp., printed in English and Gaelic, 3s 6d. (about 49 U. S. cents). Government Publications Sale Office, G. P. O., Arcade, Dublin, Ireland.

Fisheries (Consolidation) Act, 1959, No. 14 of 1959, 178 pp., printed, 10s 6d. (about US\$1.47). Government Publications Sale Office, G. P. O., Arcade, Dublin, Ireland.

ISRAEL:

Bamidgeh (Bulletin of Fish Culture in Israel), vol. 11, no. 2, June 1959, 42 pp., illus., printed in English and Hebrew. Joint Agricultural Extension Center, Division of Fisheries, Ministry of Agriculture, Tel Aviv, Israel. Includes, among others, the following articles: "Fish Pond Culture and the Water Economy in Israel," by S. Tal; and "A Key to the Tilapia Species Found

in Pond Areas," by A. Yashour and A. Hefetz.

Fishermen's Bulletin, no. 20, June 1959, 32 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, P. O. B. 699, Haifa, Israel. Contains, among others, the following articles: "Tuna Fishing on F/V Shinio Maru." by J. Carmel; and "Trawler and Trawl Gear in Action, II," by M. Ben-Yami.

JAPAN:

Bulletin of Takai Regional Fisheries Research
Laboratory, no. 23, February 1959, 91 pp.,
illus., printed, in Japanese with English summaries. Tokai Regional Fisheries Research
Laboratory, Tsukishima, Chuo-Ku, Tokyo, Japan. Includes, among others, the following articles: "Fundamental Study of the Detection of
Fish by Supersonic Wave. II--Supersonic Reflection Coefficient of Fish Net," by S. Kawada
and C. Yoshimuta; "Studies on the Effects of Net
Preservatives. I--Preserving Effects Dependent on Conditions Applying a Commercial Copper Naphthenate to Twine," by S. Takayama, Y.
Shimozaki, and K. Kanna; "Studies on Muscle
Proteins of the Squid," by J. J. Matsumoto; and
"Studies of Preservation of Marine Products by
Chemical Preservative. IV--Effect of Nitrofuran
Compounds on the Keeping Quality of Raw Fish
and Shellfish," by S. Tetsumoto.

JELLIED MEAT:

"Decomposed Meat of Tunas and Marlins. I--Observation and Statistical Analyses of Meats Collected in the Solomon Sea During the Summer, 1953; II--Components and Development of the Jellied Meat," by Suezo Asakawa and Akira Suda, article, Nankai-ku Suisan-Kenkyusho Hokoku, vol. 5, 1957, pp. 169-186, printed in Japanese. Nankai-ku Suisan-Kenkyusho Sanbashidori, Kochi-shi, Japan.

LAMPREYS:

The Lampreys of California, by Willis A. Evans, Robert C. Tharratt, and Leo Shapovalov, Inland Fisheries, Informational Leaflet No. 22, 3 pp., processed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., August 1958. Describes the three kinds of lampreys found in California: the Pacific lamprey, Entosphenus tridentatus; the brook lamprey, Lampetra planeri; and the river lamprey, Lampetra ayresii. Lampreys may be distinguished from eels and other true fishes by the possession of a circular sucking mouth, without functional jaws, the lack of paired fins, and the presence of seven external gill openings instead of the single gill opening of true fishes. Although said to be palatable, they are seldom used as a food fish. They pose a considerable problem as a parasite on food and game fish but are not nearly as dangerous a threat to fish populations as the Atlantic sea lamprey which has invaded the Great Lakes in recent years.

MARKETING

Market Survey on Canned and Frozen Sea Foods in France, Market Survey Series No. 20, 12 pp., illus., printed. Ministry of Commerce and Industry, Government of India, New Delhi, India, 1959. This pamphlet presents results of an investigation of potential markets in France for frozen and canned shrimp, frog legs, lobster tails, and other shell-fish, in order to assist Indian manufacturers and exporters in establishing sales there. Topics discussed are the size and nature of the market, regulations and other requirements, and channels of trade. Also included are tables summarizing French imports, exports, and importers of canned and frozen shellfish.

NORWAY:

Fisket-Feltet (Fishing Field), vol. 1, no. 1, July 1959; vol. 1, no. 2, August 1959, 8 pp., illus., printed in Norweglan, 50 Øre per issue (7 U. S. cents). Fiske-Feltet, Øvregt. 7, Alesund, Norway. The first two issues of a new fishery periodical.

NUTRITION:

"The Effect of Concentrates of Polyunsaturated Acids from Tuna Oil upon Essential Fatty Acid Deficiency," by Orville S. Privett, Erik Aaes-Jorgensen, Ralph T. Holman, and Walter O. Lundberg, article, Journal of Nutrition, vol. 67, March 19, 1959, pp. 423-432, printed. The Wister Institute of Anatomy and Biology, 36th St. at Spruce, Philadelphia 4, Pa.

OCEANOGRAPHY:

Annual Report of the Oceanographic Institute,
Fiscal Year 1957-1958, 21 pp., processed. The
Oceanographic Institute, Florida State University, Tallahassee, Fla., 1959. Describes the functions and activities of the Oceanographic Institute during the fiscal year July 1, 1957, to
June 30, 1958.

"Oceanographers Need Ships," by Richard Litell, article, Science News Letter, vol. 76, no. 12, September 19, 1959, pp. 186-187, illus., printed. Science Service, Inc., 1719 N St., N. W., Washington 6, D. C. Discusses a recent report by the National Academy of Sciences-National Research Council on the current status of the marine sciences in this country which contains a series of "minimal" recommendations for the improvement of oceanographic research. It urges the Government to expand its support of the marine sciences at a rate which would result in at least a doubling of basic research activity during the next ten years. It also urges that this increased support be accompanied by a new program of ocean-wide surveys, requiring a doubling of the present research effort. According to the author, "Neither of these recom-mendations can be carried out without an increase in the number of research ships available for exploration. With specific regard to ships, therefore, the Committee further recommended that a shipbuilding program be started, aimed at replacing, modernizing, and enlarging the number of ocean-going ships now being used for research, surveying and development.

OYSTER PESTS:

The Biology and Control of the American Whelk
Tingle UROSALPINX CINEREA (Say) on English
Oyster Beds, by D. A. Hancock, Fishery

Investigations, Series 2, vol. 22, no. 10, 69 pp., illus., printed, 17s 6d. (about US\$2.45). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1959.

OYSTERS:

"Oyster Farming in Australia," by L. T. Sardone, article, World Fishing, vol. 8, no. 9, September 1959, pp. 61-63, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London, N. W. 1, England. Describes methods used in the cultivation of the Sydney rock oyster in New South Wales. This oyster is cultivated by various methods at points along 1,300 miles of the eastern Australian coastline. The bulk of oysters marketed in Australia is produced in New South Wales from oyster farms leased out by the Government, and production from New South Wales accounts for over 95 percent of the Australian total.

PHILIPPINES:

The Philippine Journal of Fisheries, vol. 5, no. 1, January-June 1957, 91 pp., illus., printed. Department of Agricultural and Natural Resources, Manila, Philippines. Contains articles on: "The Balat Fisheries of Maqueda Bay, Samar, Philippines," by Jose R. Montilla and Hilario C. Antonio; "Growth Types of the Pacific Pilchard (Sardinops caerulea Girard): An Analysis of Samples of the Pacific Pilchard on the Basis of Length-Frequency Distribution at Different Ages," by Inocencio A. Ronquillo; and "Marine Fisheries of the Central Visayas," by Santos B. Rasalan.

PIKE BLENNY:

Some Aspects of the Behavior of the Blennioid

Fish CHAENOPSIS OCELLATA (Poey), by C.
Richard Robins, Craig Phillips, and Fanny
Phillips, 10 pp., illus., printed. (Reprinted
from Zoologica, Scientific Contributions of the
New York Zoological Society, vol. 44, part 2,
July 20, 1959, pp. 77-83.) Contribution No. 230,
The Marine Laboratory, University of Miami,
1 Rickenbacker Causeway, Miami 49, Fla.

PLAICE:

The Spawning of Plaice in the North Sea, by A. C. Simpson, Fishery Investigations, Series 2, vol. 22, no. 7, 113 pp., illus., printed, L1 17s 6d. (about US\$5.25). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1959.

POISONOUS FISH:

The Venomous and Poisonous Fish of Guadeloups, by A. Ebroin, Fishery Publication No. 3, I4 pp., illus., translated from French. Caribbean Commission, Kent House, Port-of-Spain, Trinidad, W. I., 1959.

PRESERVATION:

'Boric Acid-Free Preservation of Fresh Shrimps and Shrimp Meat--II," by W. Ludorff, Chr. Hennings, and K. E. Neb, article, Zeitschrift fur Lebensmittel-Untersuchung und - Forschung, vol. 108, 1958, pp. 330-341, printed in German. J. F. Bergmann, Leopoldstrasse, 175, Munich 23, Germany.

PRESERVATION BY IRRADIATION:

Radiation Preservation of Food, PB-151493, 461 pp., illus., printed, \$5. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1959.

QUALITY:

"Improvement in Quality of Iced White Fish.
Factors Affecting Quality and Tetrazolium Color Test," article, Food Investigation 1957, Report of the Food Investigation Board (Great Britain), pp. 3-4, printed. Department of Scientific and Industrial Research, Charles House, 5-11 Regent St., London S. W. 1, England, 1958.

"Improvement in Quality of Iced White Fish.
Temperature Conditions at Inland Markets and
Retailers' Premises," article, Food Investigation 1957, Report of the Food Investigation
Board (Great Britain), pp. 7-9, printed. Department of Scientific and Industrial Research,
Charles House, 5-11 Regent St., London, S. W. 1,
England, 1958.

QUALITY CONTROL:

Setting Up a Quality Control and Technical Development Laboratory, by James R. Irving, Technical Aids for Small Manufacturers No. 65, 4 pp., printed. Small Business Administration, Washington 25, D. C., June 1959. A one-man testing laboratory to check incoming materials can be the first step in establishing quality control and technical development in a plant. Savings from improved uniformity in manufacturing conditions and in product quality can often make such a project self-supporting. Consistent product development can later turn the laboratory into a money-maker. A long-range new products program will eventually insure the firm's continued existence, profitability, and growth.

REFRIGERATION:

The Role of Refrigeration in the World's Food Supply, by Mogens Jul, Publication No. 12, 23 pp., illus., processed. Danish Meat Research Institute, Roskilde, Denmark, 1959. This study is the outline for an address at the opening session of the 10th International Congress of Refrigeration, Copenhagen, August 19, 1959. The author discusses the need for refrigeration during processing and storage, increased need for transportation of food, trends in modern food distribution, nutritive problems, effect of extra handling on cost, effect on taste, and the food of the future. It also contains statistical tables showing data on refrigeration and refrigerated products. Some information on fishery products is included.

RESEARCH VESSEL:

"The Design of a Research Stern Fishing Trawler," by J. C. Esteves Cardoso and C. R. Caldiera Saraiva, article, World Fishing, vol. 8, no. 9, September 1959, pp. 48-50, illus., printed. World Fishing, John Trundell, Ltd., St. Richards House, Eversholt St., London N. W. 1, England. Part 1 of a paper read at the meetings of the Institution of Naval Architects held in Lisbon in June 1959. Explains in detail the

need for expansion of the Portuguese fishing fleet and exploration for new fishery resources. According to the author the association of Trawler Owners hopes to meet this need with a new research vessel of the most modern design; fitted for stern trawling and equipped with air conditioning, twin Diesel engines, research laboratories, facilities for fish processing, and various types of navigation and fish-finding aids. The types of gear selected are specially concerned with trawling, long-lining, and bait fishing for tuna.

SALMON:

Character of the Migration of Pink Salmon to Fraser River Spawning Grounds in 1957, by F. J. Ward, printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada.

"Retinal Responses of Pink Salmon Associated with its Downstream Migration," by M. A. Ali and W. S. Hoar, article, Nature, vol. 184, no. 4680, July 11, 1959, pp. 106, 107, illus., printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London W. C. 2, England.

SALT FISH:

"Some Preliminary Experiments Towards Developing a Method of Salt Curing Fish Suitable for West Indian Conditions," by W. A. King Webster, article, The West Indies Fisheries Bulletin, no. 3, May-June 1959, pp. 5-9, processed. Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad, W. I. Describes the technique employed in wet salt-curing carite, a locally-caught fish, and the results obtained, including acceptability, length of storage, cost, and suitability of containers.

SARDINES:

"Experiments in Cooking Sardines--I," by R.
Meesemaecker and Y. Sohier, article, Food
Manufacture, no. 34, April 1, 1959, pp. 148-153,
printed. Food Manufacture, Leonard Hill, Ltd.,
Eden St., London N. W. 1, England.

SHRIMP:

"Resumen de Situacion de Camarones en Pana-ma" (Summary of the Shrimp Situation in Panama), by Juan L. Obarrio, article, Mar y Pesca, vol. 2, no. 1, January-July 1959, pp. 31-33, printed in Spanish. Instituto Nacional de la Pesca, Havana, Cuba.

TAIWAN:

Report of the Institute of Fishery Biology of Ministry of Economic Affairs and National Taiwan University, vol. 1, no. 3, June 1959, 64 pp., Illus., printed in English with Chinese summaries. The Institute of Fishery Biology, No. 89, Sec. III, South Sin Sun Road, Taipei, Taiwan, China. Contains among others, the following articles: "Studies on the Elasmobranch Fishes from Formosa. Part II--A New Carcharoid Shark, Carcharias yangi, from Formosa," by H. T. Teng; "The Distribution and Fluctuation of Some Demersal Fishes of Taiwan Straits," by F. H. Liu and G. C. Chen; "Anchovies Found in Taiwan," by S. C. Shen; and "A List of Edible Mollusks of Taiwan," by T. Y. Ho.

TENNESSEE VALLEY AUTHORITY:

1959 Annual Report, 13 pp., illus., printed. Fish and Game Branch, Division of Forestry Relations, Tennessee Valley Authority, Knoxville, Tenn. Discusses briefly accomplishments of 25 years of TVA fish and game activities. The most notable, of course, has been the expansion in the area of fishing water from 116,000 to 600,000 acres. The report mentions that TVA by law must operate its reservoirs for flood control, navigation, and power production. Development of fish and wildlife resources is secondary but, fortunately, there is no great conflict between the two interests. Current activities include population studies, tagging studies, fish stocking, water temperature and spawning data collection, enclosed fishing docks, and encouragement of sport and commercial fishing.

TERRITORIAL WATERS:

The Icelandic Fishing Limits, 20 pp., printed in German and English. Verband der Deutschen Hochseefischereien E. V., (23) Bremerhaven-F., Postfach 340, Germany, June 1959. In September 1958, the Icelandic Government submitted to the General Assembly of the United Nations a Memorandum in which it attempted a detailed justification of the extension of its fishing limits from 4 to 12 nautical miles. In its Memorandum, the Government of Iceland relies on legal, biological and economic arguments. This article presents the views of other nations of Europe regarding Iceland's arguments on the extension of its fishing limits.

TRADE LIST:

The Office of Economic Affairs, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 a copy.

Fish and Whale Meat Meal--Producers--Peru, 4 pp. (June 1959). Lists the names and addresses of some sixty fishing companies operating fish meal plants. Only three of these plants are listed as producers of whale-meat meal.

Oils (Animal, Fish, and Vegetable) -- Importers, Dealers, Producers, Refiners, and Exporters, Ecuador, 11 pp. (July 1959). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish oils.

Oils (Animal, Fish, and Vegetable) -- Importers, Dealers, Producers, Refiners, and Exporters, Haiti, 6 pp. (July 1959). Lists the names and addresses, size of firms, and types of products handled by each firm. Fish oils not listed specifically by any firm.

Oils (Animal, Fish, and Vegetable) -- Importers, Dealers, Producers, Refiners, and Exporters, The Netherlands, 22 pp. (July 1959). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish oils.

TUNA:

"Sobre Atuns de Angola" (On Tuna of Angola), by H. Vilela and R. Monteiro, article, <u>Boletim da</u> <u>Pesca</u>, vol. 12, no. 64, September 1959, pp. 11-54, Illus., printed in Portuguese with abstracts in French. Boletim da Pesca, Avenida da Liberdade, 211-4, Lisbon, Portugal.

UNDERWATER TELEVISION:

"Underwater TV and the Fisheries (2)," by Jay Russell, article, World Fishing, vol. 8, no. 8, August 1959, pp. 50-54, fillus., printed. John Trundell (Publishers), Ltd., St. Richards House, Eversholt St., London N. W. 1, England. In the first part of this article, published in the June issue of World Fishing, the author described some of the work already accomplished by underwater television. In this second part, he evaluates the potential of underwater television and appraises its future for marine research and for use in the fisheries. He concludes that its primary importance will be for studying fishing gear and the reactions of fish to gear.

UNION OF SOUTH AFRICA:

Fishing Industry Research Institute, Twelfth Annual Report of the Director, 1 January 1958–31 December 1958, 70 pp., illus., printed. Fishing Industry Research Institute, Cape Town, Union of South Africa. Includes functions and activities of the Institute and brief accounts of progress in its program of research during 1958. Presents the results of investigations covering fresh, salted and dried, fried, and canned fish; fish meal; stickwater recovery; fish flour; and routine inspections and analyses.

UNITED KINGDOM:

Grimsby, The World's Premier Fishing Port, 150 pp., illus., printed. The Grimsby Fishing Vessel Owners' Association, Fish Dock Road, Grimsby, England, 1959. An interesting handbook, illustrated with both photos and sketches, describing the historical, technological, economic, and political aspects of the British fishing port of Grimsby. It contains chapters on the years of development; the fishing industry, and how it works; Grimsby Fishing Vessels Owners' Association; development of the fishing vessel; development of fishing gear; radio in the fishing industry; the fishermen of Grimsby; training programs; sales by auction; fish merchandising; cold storage; export of fish; British cod liver oil; coal and oil bunkering; shipbuilding, repairing, and engineering; subordinate trades; research; meteorological services: Ministry of Agriculture, Fisheries, and Food; The White Fish Authority; and fish facts. Also included are plan of the docks, map of the fishing grounds, and diagrams of trawler and seine-net vessels.

Herring Industry Board, Twenty-Fourth Annual Report, 1958, 54 pp., printed, 3s. (42 U.S. cents). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, July 1959. Reports on the state of the herring fisheries of the North Sea; commercial and statutory matters concerning the Herring Industry Board, the catchers, and shore-based sections of the in-

dustry; marketing; production, research, and development; and related subjects. Contains statistical tables showing the landings and value of catches and disposal of landings during the winter, summer, and autumn seasons; composition of fleets in the Irish Sea area and East Anglia; curing strength and production of cured herring; imports of fresh and frozen herring; disposal of the United Kingdom's total herring landings, excluding imports; and applications for grants and loans. The appendix consists of a summary of pertinent directions having seasonal effect which were issued during 1958. The report states that preparations were made during the year for the introduction of a new Convention to replace the International Fisheries Convention of 1946. A feature of the new Convention which was absent from the earlier one is the inclusion of herring among the species which may become the subject of measures of conservation.

VESSELS:

"Methods of Assessing Fishing Craft Depreciation," by John Proskie, article, Trade News, vol. 12, no. 2, August 1959, pp. 8-9, illus., printed. Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. One expense item of considerable importance in any fishing enterprise is depreciation, although it is a noncash expenditure in any particular year. In the studies conducted by the Canadian Department of Fisheries, the "straightline" method of computing depreciation is used. This consists of simply dividing the total anticipated depreciation (wear, tear, and obsolescence) by the number of years the asset is expected to last. "Although certain parts wear out faster than others, a depreciation rate of $7\frac{1}{2}$ percent closely approximates in fact the average yearly wear and tear of boat and equipment over a period of about 14 years," states the author. Since depreciation is a cost of production, like any other, it should be kept as low as possible. However, the basic principle still holds true that cost accounts should show the true facts'in respect to expenditures and returns for the enterprise and the net worth of the asset.

VITAMIN A:

Vitamin A₁ Aldehyde in the Eggs of the Herring (Clupea harengus L.) and Other Marine Teleosts, by P. A. Plack, S. K. Kon, and S. Y. Thompson, article, The Biochemical Journal, vol. 71, March 1959, pp. 467-476, printed. The Biochemical Journal, Cambridge University Press, Bentley House, 200 Euston Rd., London N. W. 1, England.

YEARBOOKS AND DIRECTORIES:

Business Statistics, 1959 Edition (A Supplement to the Survey of Current Business), 357 pp., printed, \$2.25. Office of Business Economics, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A historical compendium and reference book containing monthly and annual data for over 2,600 statistical measures of the U. S. economy.

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